VOLUNTARY DISCLOSURE INCENTIVES: A STUDY OF THE DETERMINANTS OF SECURITY ANALYSTS' DISCLOSURE SCORES

BY

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TABLE OF CONTENTS

Abstract of Dissertation Presented to the Graduate School
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This research empirically examines a firm's incentives for discretionary disclosures. It contributes to existing literature in this area in three ways. First, instead of looking at the information content or accuracy of disclosures, management's motives and incentives for discretionary disclosures are identified and tested. Second, the hypotheses tested are drawn from recent theoretical literature in order to bridge the gap between theory and empirical findings. Third, overall disclosure scores, calculated by professional security analysts and reported annually for a sample of firms, are used as the measure of disclosure in this study. These scores capture information released voluntarily by firms in annual and quarterly reports, other public releases and directly to financial analysts. Thus, they provide a more comprehensive measure of disclosures as compared to some of the other measures used previously.

The results suggest that a firm's disclosure strategy is determined by both cost and benefit considerations. One potential benefit of disclosures is that it reduces a firm's cost of capital. Firms with higher disclosure scores are found to face a lower cost of debt and

enjoy narrower bid-ask spreads. Moreover, firms in greater need for external financing are found to have higher disclosure scores. A second possible incentive for disclosures could be to reduce legal liability. Timely disclosures can reduce the risk of lawsuits typically filed by investors after large stock price decreases. The positive relationship between disclosures and institutional ownership observed here is consistent with the argument that these investors put more pressure on firms to disclose information than ordinary investors.

Possible costs of disclosures could be a reduction in management's information advantage. While no relationship between disclosures and insider trading was observed in this study, the strong negative association between the disclosure scores and the proportional stock ownership of the CEO suggest that large shareholders with inside information prefer to maintain their information advantage. Disclosure of proprietary information could also increase political costs in the form of threat of regulation or sanctions and reduce the firm's competitive edge in the industry. The results provide weak support of this argument.

CHAPTER 1
INTRODUCTION AND BACKGROUND

This study presents an empirical examination of a firm's motives and incentives for disclosure or nondisclosure of private information. It is generally observed that many firms release information beyond that required by the FASB. Such information comes with the financial reports in the form of disclosures on corporate policies, risk, etc., through public releases such as management forecasts, and through private releases to financial analysts. Yet, other firms seem to be reluctant to release any information beyond the minimum required. While there is a substantial amount of *theoretical* literature on a firm's (or firm manager's) incentives for disclosure of private information, *empirical* literature on voluntary disclosures (confined mostly to management forecasts) has largely focused on the information content of the forecasts or their predictive accuracy. Not a lot of attention has been devoted to empirically examining a firm's disclosure choices.[1] As King, Pownall and Waymire (1990, p. 114-15) have argued:

> The literature on management forecasts.....has not yet produced a consensus on the economic determinants of management forecast choices.
>
> No consensus has emerged because (a) most recent studies are directed to consolidating the evidence on the informational value and selective disclosure issues; (b) managers' disclosure choices are treated as dichotomous, either forecasting, or not disclosing; and (c) the empirical evidence on forecasts is largely inconsistent with theoretical work where disclosure serves either as a signal of favorable information or as a mechanism to alleviate agency problems. The literature needs a unifying framework for interpreting documented empirical regularities and defining the direction of future empirical research.

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[1]Recent exceptions are Lang and Lundholm (1993), Scott (1994), Dechow, Sloan and Sweeney (1994), and Healy, Palepu and Sweeney (1994).

This paper attempts to deal with some of the problems mentioned above. First, instead of looking at the information content or accuracy of disclosures, this study concentrates on identifying management's motives and incentives for voluntary disclosure or nondisclosure of their private information. This could be useful to auditors, investors, financial analysts and regulatory authorities. Improved understanding of management's disclosure incentives could help auditors in making proper evaluations of inherent risk of an engagement and the related audit effort decisions. Similarly, investors could make decisions on which stocks to buy or sell and how much to spend on information search based on their evaluation of a firm's disclosure incentives. It could also help regulatory authorities like the SEC in properly evaluating existing stock ownership and other restrictions, and the FASB in identifying areas that may need further regulation.

Second, the hypotheses developed are general enough that they hold for most types of voluntary disclosures. While much of the empirical literature has concentrated on management forecasts, firms also voluntarily reveal a lot of other information through financial reports, other publications, or indirectly through discussions with financial analysts. To incorporate these disclosures, overall disclosure scores, calculated by professional security analysts and reported in the Corporate Information Committee Report, are used in this study. Published annually by the Association for Investment Management and Research, this report assigns scores to firms based on their disclosure efforts. Scores are based on various aspects of disclosures, including annual reports, 10-Q, 10-K, and other publications and contact with financial analysts. The reports include 400-600 firms each year spanning 30-40 industries. An average of approximately 10 analysts examine the reporting of each industry. These reports thus provide a useful measure of a firm's overall disclosure efforts including all the relevant aspects of disclosures. Cross-sectional variation in these disclosure scores are explained in terms of the incentive variables specified above and discussed below.

Third, to bridge the gap between theoretical and empirical literature, variables hypothesized as affecting disclosure are developed from recent theoretical research on disclosure. Recent literature suggests that disclosure decisions are made based on an evaluation of possible costs and benefits of this decision. Following this line of reasoning, it is argued that a firm has incentives to disclose its private information to the extent that such disclosures reduce its cost of capital and legal liability. Disclosure of such proprietary information on the other hand could have an adverse effect on the disclosing firm through aggressive reaction by competing firms, potential entry of new firms or increased political costs in the form of threat of regulation and sanctions for antitrust violations. Disclosure of financial information, by reducing the asymmetry in the market, could also reduce the management's scope for profiting from their private information. Firm managers with significant stock ownership may thus have incentives to maintain their information advantage. It is likely that a firm's actual disclosure strategy would depend on all of these costs and benefits so that the entire set of incentives is tested for simultaneously.

Results of this study provide evidence in favor of the majority of the hypotheses tested. First, disclosures are found to be negatively associated with the proportional stock ownership of the CEO. This is in accordance with the predictions of Hakansson (1981) and Kim (1993) who argue that large shareholders with more inside information would prefer less disclosures, as compared to shareholders who do not have superior information. Second, a positive relationship between disclosures and institutional ownership is observed which is consistent with the argument that these investors put more pressure on firms to disclose information than ordinary investors. Third, the results are in support of Diamond and Verrecchia (1991) and Lev (1992)'s arguments that disclosures improve a firm's cost of capital. Thus, firms with higher disclosure scores are found to face a lower cost of debt and enjoy narrower spreads. Moreover, firms in greater need for external financing are found to have higher disclosure scores. The results also provide

some support for the proprietary cost hypothesis put forward by Verrecchia (1983), Darrough and Stoughton (1990) and others, although the results are not robust enough to hold under all proxies of proprietary costs. The hypothesized negative relationship between disclosures and insider trading is not supported by the data. Similarly, a negative relationship between disclosures and the firm's cost of equity is also not observed for the sample.

The dissertation is organized as follows. Chapter 2 gives a brief summary of the empirical literature on voluntary disclosures; chapter 3 develops the hypotheses to be tested; chapter 4 discusses the disclosure variable and sample characteristics; chapter 5 discusses research methodology; chapter 6 reports the results and the last chapter summarizes the conclusions.

CHAPTER 2
REVIEW OF LITERATURE

Introduction

Much of the early empirical research on voluntary disclosures has looked at the capital market reaction to a large variety of disclosures, including management forecasts. The literature generally reports a significant market reaction to such disclosures. As expected, the reaction is positive for "good news" disclosures and negative for "bad news" disclosures. Recent literature has also focused some attention on the issue of why firms voluntarily disclose or withhold private information.

Market Reaction to Disclosures

Woolridge (1988) investigated investors' reactions to announcements of joint venture formations, new research and development and capital expenditure programs, and product development strategies. The results indicated a statistically significant positive market reaction to such announcements, on average. Similar results were obtained by Schipper and Thompson (1983) for the announcement of acquisition programs and by Chanery, Devinney and Winer (1991) for new product announcements. Negative information releases on the other hand were found to be associated with negative stock price reactions. Thus Kellogg (1984) documented a negative price reaction to announcements of public litigation.

Research on the market reaction to management forecasts yielded similar results. Forecasts were generally found to be price informative. Thus, researchers like Patell

(1976), Jaggi (1978), Nichols and Tsay (1979), and Penman (1980), all documented statistically significant stock price reactions to management forecasts. Ajinkya and Gift (1984) and Waymire (1984) also showed that stock price changes are positively associated with the unexpected component of the forecasts. Pownall, Wasley and Waymire (1993) indicated that forecasts are less informative than earnings announcements.

Incentives for Management Forecasts

A number of recent papers have addressed the question of why firms issue management forecasts. Ajinkya and Gift (1984) argued that firms issue forecasts to align investors' expectations with that of the management. Investors' reaction to earnings forecasts were found to be consistent with this hypothesis. King, Pownall and Waymire (1990) extended this "expectations adjustment hypothesis" to argue that credible and timely disclosures can reduce asymmetry of information in the market and thus lead to lower transactions costs and higher stock prices.

The possible link between disclosures and capital markets suggests that firms in greater need of external financing would have a stronger incentive to achieve a lower cost of capital (cost of equity, cost of debt and transactions cost) through disclosures. Indeed, Ruland, Tung and George (1990) found that management forecasts are more likely to be followed by capital issues. Frankel, McNichols and Wilson (1995) went further to show that firms' external financing requirements and its tendencies to disclose management forecasts are positively associated over long periods of time. They observed, however, that firms with offerings are not any more likely to forecast in the immediate period before the offering, as compared to other periods.

Apart from reducing a firm's cost of capital, disclosures could also reduce potential costs arising from litigation that can follow large negative earnings surprises. In support of this argument Skinner (1994) documented that managers are more likely to make

voluntary disclosures when the threat of a large negative earnings surprises exists, as at other times. Similarly, Kasznik and Lev (1995) found that firms were much more likely to make public releases before negative earnings surprises than before positive earnings surprises. Moreover, they found that the larger the surprise, the more quantitative and earnings related the releases.

All of the above arguments are based on the assumption that firm managers take actions in the best interest of the shareholders. Accounting, finance and economics literature provide numerous evidence contrary to this hypothesis. It is likely that firm managers with inside information can use such information to their advantage. Given that disclosures reduce their information advantage, they may have incentives to refrain from making timely disclosures. Ruland, Tung and George (1990) found that firms with larger percentage of insider ownership are less likely to make management forecasts.

Disclosure Incentives in the Context of other Disclosure Measures

Management earnings forecasts of course are not the only type of voluntary disclosures. Firms can release information beyond minimum requirements in annual reports, quarterly reports, through public releases and to financial analysts. A few recent papers have examined management's disclosure incentives in the context of these other disclosures.

Scott (1994) tested for management's incentives for voluntary disclosures of defined benefit pension plan information. Drawing on Verrecchia's (1983) idea of proprietary costs, Scott argued that firms may withhold pension plan information if the release of such information results in large costs through actions of employees. He measured proprietary costs in terms of strike incidence prior to disclosures (firms with higher strike incidence are more likely to have strikes in the future), average hourly wages paid (these firms are less likely to yield increases in wages in the future) and return on assets of the firm as

compared to the industry (labor unions are likely to extract bigger wage concessions from more profitable firms). His results generally supported the hypothesized negative relationship between disclosures and proprietary costs arising from the labor market.

Dechow, Sloan and Sweeney (1994) considered a sample of firms subject to enforcement actions by the SEC for violating its disclosure requirements. Their analysis indicated that firms in greater need for external financing and higher leverage are more likely (as compared to a control group) to violate disclosure requirements and pursue "aggressive" reporting strategies. Violating firms were also found to have a greater percentage of insiders in the firm's board of directors. The percentage of shares held by the CEO, however, was not significantly different across the two groups. Subsequent to the announcement of the violations, the violating firms were found to experience a significant decrease in stock returns, the number of analysts following the firm and an increase in the bid-ask spread. The study also investigated whether there was a decline in the number of institutions holding stock of the firm after the announcement of the violations but no such effect was observed.

Recently, a few papers have examined potential determinants of a firm's overall disclosure strategy as proxied by aggregate disclosure scores assigned to firms by a group of financial analysts. As cited in Chapter 1, these scores are prepared annually by members of the Association for Investment Management and Research and include a sample of roughly 400-600 firms. They are based on all aspects of disclosures and thus provide an overall measure of a firm's effectiveness in communicating with investors.[1] Lang and Lundholm (1993) used these data to examine the cross-sectional variation in disclosure practices of firms. Their study indicated that the disclosure ratings are increasing in firm size (as measured by market value of the firm's stock), decreasing in the correlation between earnings and returns, and higher for firms issuing securities in the

[1]See Chapter 4 for a description of the Report.

current or future period. Evidence also suggested that the standard deviation of stock returns is higher for low disclosure firms.

In a more recent study, Healy, Palepu and Sweeney (1994) examined factors associated with significant changes in a firm's disclosure strategy. Their sample consisted of firms that experienced large and sustained changes in disclosure rankings given by the financial analysts. Their study revealed that firms experiencing improvements in disclosure rankings were undergoing significant management changes and corporate restructuring. These firms were also observed to have a higher frequency of security issues and larger trading volume. Moreover, the group of firms with improvements in disclosure rankings were found to have a higher frequency of stock splits and repurchases. This was interpreted as a tendency by the disclosing firm to signal potential undervaluation of stocks to the market. Firms experiencing large decreases in disclosure rankings, on the other hand, did not seem to access the capital markets as frequently and generally experienced performance declines and increases in dispersion in analysts' forecast errors. No decline in trading volume, number of analysts following or institutional ownership was observed for this group.

Farragher, Kleiman and Bazaz (1994) examined the relationship between the disclosure scores and the dispersion and accuracy of security analysts' earnings per share forecasts. They found that the dispersion of analysts' forecasts is lower for firms receiving higher disclosure scores. No relationship was observed between the disclosure scores and the accuracy of the forecasts.

Scope of the Present Research

While the recent literature on voluntary disclosures has examined a number of possible incentives for such decisions, there are some relatively unexplored areas. First, a number of researchers have assumed a link between disclosures and cost of capital to

empirically demonstrate a relationship between a firm's capital requirements and its disclosure policies. The present research directly investigates the validity of this assumption by examining a firm's cost of capital subsequent to disclosures. Second, limited attention has been devoted to the possible role of proprietary costs on a firm's disclosure decisions. The role of such costs on a firm's overall disclosure efforts is examined here. Third, much of the empirical literature on discretionary disclosures assumes that firm managers aim to maximize firm value. In reality, however, it is likely that firm managers' incentives depend on the nature of their ownership and compensation structure. To the extent that their disclosure strategy affects the value of their holdings and/or compensation, they will take their personal gains and losses into their decision making. This issue is explored by looking at the association between disclosures and management's stock ownership and insider trading activity. Fourth, unlike much of previous research, management's disclosure incentives are examined in the context of analysts' disclosure scores which provide a more comprehensive measure of a firm's disclosure efforts.

CHAPTER 3
HYPOTHESIS DEVELOPMENT

Introduction

Much of the theoretical literature on voluntary disclosures argues that a value maximizing firm should disclose all available information quickly, whether good or bad, unless there are significant costs associated with such disclosures. Disclosures are argued to improve investors' perception of the company and management's ability to deal with economic changes, reduce cost of capital and transaction costs, and reduce the likelihood of litigation. The apparent lack of voluntary disclosure is explained in terms of costs of such disclosures. These include direct costs of collecting and publishing information, as well as indirect costs in terms of loss in sales or profits due to adverse action by competing firms, potential entry of new firms in the industry and political costs in the form of threat of regulation. Disclosures could also impose costs on firm managers in the form of reduced opportunities for profitable trading on the basis of their private information. Existence of these costs may induce a firm manager to withhold their private information.

All these costs and benefits would provide firm managers with differing incentives. This paper focuses on three broad types of incentives: (i) stock ownership incentives, (ii) proprietary cost incentives, and (iii) cost of capital incentives. Tests of these incentives are designated by identifying some factors as *antecedent* or leading to disclosures, as well as some as *consequences* of disclosures. The distinction between these two types of incentives is important for designing the tests, as will be seen below. A summary of the hypotheses developed and research design is given in Figure 3.1.

Ownership Incentives

The ownership structure of a firm can provide firm managers with differing incentives. Clearly, firm managers holding a significant amount of the company's stock could manipulate the release of private information in order to maximize the return on their holdings. Literature on insider trading generally indicates that firm managers and insiders trade to profit on the basis of their private information. Firm managers, however, may not always have incentives to withhold private information. Institutional ownership could provide firm managers with incentives to release information voluntarily. The high monitoring skills and sophistication of institutional investors may indicate a greater threat of legal liability from nondisclosure of information. Three hypotheses are developed based on these arguments.

Insider Trading Hypothesis

It has long been noted that firm managers can profit from trading shares of their company. Although US laws limit such trading substantially, opportunities for profitable trading still remain. Current laws prohibit insider trading when the insider both buys and sells shares within a six-month period. Otherwise, the laws prohibit trading based on "material" inside information. Clearly, this is often difficult to identify. Insiders could also choose not to report their trades and these may then go undetected. All of this suggests that firm managers and insiders have opportunities to potentially gain from trading on the basis of their private information.[1]

Research on insider trading has shown that firm managers earn abnormal profits on their stock trades. Studies like Lorie and Niederhoffer (1968), Jaffe (1974) and Finnerty (1976) have indicated that abnormal profits could be as high as 30 percent during a three year holding period. In an accounting context, researchers have shown that corporate

[1]Whether gains will be realized for a particular sample depends on how the insiders act given all the above restrictions.

insiders engage in "profitable" trading around the time of some mandated accounting changes. Thus, Larcker, Reder and Simon (1983) have shown that around the period of the exposure draft for SFAS 19 (which required the elimination of full cost method for successful efforts method for the oil and gas industry), insiders of full cost firms were selling relative to insiders of successful efforts firms. Similarly, Odaiyappa and Nainar (1992) provided evidence suggesting that insiders engaged in profitable trading prior to the release of current cost accounting figures mandated by SFAS 33. Specifically, the research showed that insiders of firms that anticipate current cost income to be lower (higher) than historical cost income engage in net selling (buying) prior to the information release.

These results suggest that insiders can take advantage of their superior information to engage in profitable trading. The scope for gains through insider trading is likely to be higher, the greater the degree of asymmetry of information in the market. Disclosures, by reducing the asymmetry of information in the market, can thus reduce insiders' scope of profiting from their private information. Firm managers may then have incentives to withhold information to the extent that they can gain from such withholding through stock trading. This leads to the following (antecedent) hypothesis:

> H1: Voluntary disclosure of information (DISC) is negatively associated with the volume of trading (TRADE) by the insiders of the disclosing firm.

CEO Stock Ownership Hypothesis

A somewhat related issue is the relationship between disclosures and managerial stock ownership. In recent years there has been a lot of research on the possible impact of a managerial stock ownership on their decision making. Berle and Means (1968) argued that managers with limited equity ownership will act in their own interest and not necessarily in the shareholders' interest. Jensen and Meckling (1976) later extended this line of reasoning to argue that large dispersion in external shareholdings would limit

shareholders' ability and incentives to monitor management's activities causing firm manager's actions to deviate from firm value maximization. This view, however, is not universally supported. Fama and Jensen (1983), and, Demsetz and Lehn (1985) have argued that large stock ownership by the management reduces their opportunity for diversification and makes them more conservative about investment decisions. This may lead firm managers with large stock ownership to deviate from actions that smaller shareholders prefer.

Empirical literature on the impact of management stock ownership on corporate decisions do not provide evidence of any consistent link between management ownership and firm performance. While some studies provide evidence of a weak relationship between ownership and corporate performance, others document no such relationship. Stigler and Friedland (1983) find no link between corporate profits and the nature of corporate ownership (owner-controlled or management controlled) and Demsetz and Lehn (1985) finds no relationship between corporate profits and ownership concentration. Morck, Schliefer and Vishny (1988) suggested that the relationship between firm performance and ownership of the board of directors is nonlinear with performance increasing in ownership initially but decreasing subsequently.

Recent literature has devoted limited attention to exploring the link between management's stock ownership and a firm's disclosure decisions. The nature of stock ownership, however, could be an important facet of a firm's disclosure decisions. Hakansson (1981) and Kim (1993) have shown that in an economy where agents have rational expectations, well-informed shareholders would prefer less disclosure than the less-informed. It may be reasonable to assume that company officials are better informed about the firm's future than are smaller shareholders. Company officials are also more likely to be in a position to affect the firm's disclosure decisions. This may suggest that the larger the proportional stock ownership of the company executives, the lower their incentives for disclosures. Moreover, firm managers with large stock ownership might be

less susceptible to pressures of disclosing information from other shareholders and financial analysts. This suggests the following (antecedent) hypothesis:

> H2: Voluntary disclosure of information (DISC) is negatively associated with the proportion of total shares of the disclosing firm held by the company executives (OWN).

Institutional Ownership Hypothesis

Another factor that could have potential impact on a firm's disclosure decisions is the nature of institutional ownership. Institutional ownership in the US has increased significantly in recent years. The Federal Reserve Bulletin (1993), for example, reports that assets of mutual funds have increased by about 86 percent over the period 1989-92. Equity ownership of other financial institutions has also increased significantly during the last decade. Hence it is important to examine the relationship between such holdings and a firm's disclosure strategy.

The increased sophistication and power of the institutional investors in recent years have led some to argue that such ownership creates incentives to monitor managerial activities. This "active monitoring hypothesis" is based on Demsetz (1983) and Schleifer and Vishny (1986) who argue that owners of large blocks of shares have greater incentives to monitor management's activities. Recent empirical literature provides some support to this argument. Jarrell and Poulsen (1987) found that firms with larger institutional ownership are less likely to propose harmful types of anti-takeover amendments. Similarly, Brickley, Lease and Smith (1988) found a positive relationship between institutional ownership and the proportion of shares voted against amendments that reduce shareholder wealth.

The potential role of institutions in monitoring corporate activity and exerting disciplinary action could have important implications on a firm's disclosure decisions. It is argued here that large institutional ownership in a firm indicates higher costs of

withholding information on the manager's part. These costs could be in terms of potential litigation and undervaluation of stocks. Institutions, being more sophisticated and powerful than ordinary investors, could identify cases of withheld information and organize legal action more easily as compared to atomistic investors. Skinner (1994) and Kasznik and Lev (1995) argue that the fear of legal liability could be an important determinant of a firm's disclosure decisions. They provided evidence to indicate that firm managers make clearer and more frequent public releases prior to negative earnings surprises than at other times.

Even in the absence of legal liability, Dye (1994) has shown that the presence of sophisticated investors (like institutions) in the market implies more disclosures. This is due to the fact that sophisticated investors are more likely to identify situations where the firm received information and chose not to disclose it. Nondisclosure will then lead them to infer that the firm received bad news and they will thus reestimate firm value downwards. Firms will anticipate such reaction from sophisticated investors and will have a propensity to release private information. The higher the proportion of sophisticated investors in the market, the stronger are these incentives.

Of course, if institutions got actively involved in a company's operations and got inside information, disclosures to these parties would not be necessary. However, various legal restrictions on stock ownership and control of operations by institutions prevent such involvement.[2] Institutions are thus unlikely to get private information about a company. In the absence of such private information, institutions would have an interest in applying pressure on companies to disclose relevant information in a timely manner.

Based on the above arguments the following (antecedent) hypothesis is suggested:

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[2]See Roe (1990) for a discussion on various legal and economic restrictions on institutional ownership.

H3: Voluntary disclosure of information (DISC) is positively associated with the proportion of common shares of the disclosing firm held by institutions (INST).

Proprietary Cost Incentives

A number of researchers have argued that firms may withhold private information if there are sufficiently large costs of disclosing such information. Verrecchia (1983) referred to the costs of disclosing information as proprietary costs, which includes direct costs of preparing and disseminating information and other costs associated with the disclosure of proprietary information, such as adverse action by competing firms, entry of new firms into the industry and political costs arising from possible threat of regulation and antitrust investigations, etc.. Verrecchia argued that in the absence of costs of disclosures, firms would release all information. The incentives for full disclosures arise from the assumption that investors know when firms are withholding private information. Nondisclosure in this framework causes investors to infer that the firms have bad news and this has a negative impact on stock prices. Firms, being aware of this, would release all information. If there are some costs to disclosing information, however, investors would not be able to ascertain whether firms are withholding bad news or proprietary information. Thus an equilibrium with some nondisclosure can exist when there are sufficiently large costs of disclosing information. Extending Verrecchia's idea of "proprietary costs," a number of recent researchers like Darrough and Stoughton (1990), Wagenhofer (1990), and Feltham and Xie (1992) have shown that a partial-disclosure equilibrium is feasible in situations where the disclosing firm has a potential opponent. The existence of an opponent in the market indicates that there are potentially large costs of disclosing information in the form of loss of profits, market share etc..

The proprietary cost argument is related to the idea of political costs put forward by Watts and Zimmerman (1978) who argue that firms facing costs in the form of threat of

regulation, higher taxes, or lower subsidies from federal, state, and local governments, would take actions to reduce such costs. Accounting information is often used by regulators to identify firms to be subjected to regulation, sanctions, and, higher taxes. In such a scenario it may be argued that firms facing "large" political costs would have incentives to withhold information. With less information in the market it may be easier for firms to argue or lobby against governmental sanctions. For example, a firm with high current period earnings, identified for higher taxes, may argue successfully that this arose from special economic circumstances in a situation where the regulator has less prior knowledge about the firm's financial performance.

All of these arguments suggest that firms facing significant proprietary costs would choose to maintain their information advantage and would disclose less information. The following (antecedent) hypothesis is thus suggested:

> H4: Voluntary disclosure of information (DISC) is negatively associated with the disclosing firm's proprietary cost (PROP) of revealing private information.

Cost of Capital Incentives

Cost of Capital Hypothesis

A number of researchers and practitioners have argued that disclosures can improve a firm's cost of capital. Barry and Brown (1985) used a theoretical model to argue that a firm's cost of capital is negatively related to the amount of firm specific information available in the market. Diamond and Verrecchia (1991) took this argument one step further to show that disclosure of information can reduce a firm's cost of capital by reducing information asymmetry in the market. This improves the liquidity of the firm's securities, causing the cost of capital to decrease and demand for the firm's shares to increase. In their model the market maker is assumed to be risk averse with limited risk bearing capacity. Large traders exist in the market who may or may not have private

information. The firm has incentives to attract large positions from these traders as this can lead to a lower cost of capital. This is achieved through disclosures.

While Diamond and Verrecchia (1991) formally developed the relationship between disclosures and a firm's cost of capital, the existence of such a relationship has been acknowledged by a number of other researchers including King, Pownall and Waymire (1990), Lev (1992), and, Healy and Palepu (1993). Their arguments can be summed up through the following quote from Lev (1992, p 13-14):

> The information disclosed by a company and sometimes the absence of disclosure, affect outsiders' perception of its economic condition and future prospects. These perceptions, in turn, affect key decision variables, such as the company's cost of capital and input prices. For example, when performance of a company or its financial health are under-appreciated by investors due to incomplete information, the securities of this company will be undervalued, leading to low prices and higher yields (cost of capital) for new stock and bond issues. [The detrimental effects of low capital market valuations and negative investor sentiments (e.g., relatively low analysts' forecasts of earnings) is not restricted to *new* securities issues. It is well known, for example, that bank loan officers consider the firm's capital market performance in determining the cost of loans. Similarly, large suppliers and customers watch the company's market performance and analysts' reports when considering terms of trade. The high cost of capital resulting from low valuations and negative perceptions will depress earnings and cause managers to forgo beneficial investment opportunities, impeding the firm's growth and its ability to compete.

The following (consequent) hypothesis is thus suggested:

> H5: Voluntary disclosure of information (DISC) is negatively associated with the disclosing firm' s cost of capital (COC) in subsequent periods.

Bid-Ask Spread Hypothesis

One of the components of a firm's cost of capital is the bid-ask spread of the stock. The bid-ask spread maintained by market makers in equity markets represents a transactions cost investors have to incur in their security transactions. A lower spread or

transactions cost can lead to greater stock liquidity, enhance stock prices and thus lower a firm's cost of (equity) capital.[3]

Researchers like Stigler (1964), Demsetz (1968), Copeland and Galai (1983), and Glosten and Milgrom (1985) have long argued that the degree of information asymmetry in a market is reflected in the bid-ask spread of the stock. The argument is based on the assumption that the security market has two types of traders: noise traders who trade for liquidity reasons and informed traders who trade to make a profit on their private information. Informed traders, who trade on superior private information, stand to gain on average. This implies that the market maker or specialist who performs continuous trading stands to lose on average vis-à-vis informed traders. To shield against this possibility, the market maker sets the bid-ask spread appropriately. The greater the risk of traders having private information, the wider the spread. Lev (1988), and, King, Pownall and Waymire (1990) used this idea to suggest that voluntary disclosures could reduce the information asymmetry between informed traders and the market causing the market maker to set a smaller bid-ask spread. This reduction in transactions costs can have a positive impact on stock prices, which can benefit shareholders (including managers and insiders holding the company's stock). A related hypothesis has been supported recently by Greenstein and Sami (1994) who found that subsequent to the filing of 10-K reports on segment information in 1970, there was a significant decrease in bid-ask spreads for those firms filing these reports for the first time, as compared to single-segment firms. These arguments lead to the following (consequent) hypothesis:

> H6: Voluntary disclosure of information (DISC) is negatively associated with the disclosing firm's bid-ask spread (SPREAD) in subsequent periods.

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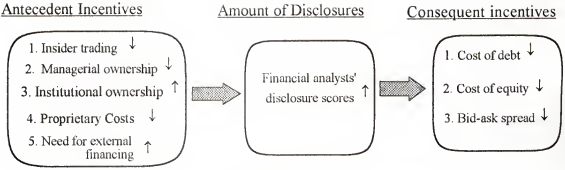
[3]The association between the bid-ask spread and stock price and liquidity has been noted by a number of researchers including Roll [1984], Hasbrouck [1988], and Stoll [1989].

External Financing Hypothesis

If disclosures reduce a firm's cost of capital, it clear that the benefits of such reduction in the cost of capital would be larger for firms in greater need of external financing. This would suggest that firms that have greater requirements for external financing would disclose more information. This hypothesis was supported by Ruland, Tung and George (1990), and, Frankel, McNichols and Wilson (1995) who found that firms that access the capital markets more frequently through capital issues are also more likely to issue management forecasts. Similarly Lang and Lundholm (1993) found a positive association between financial analysts' disclosure ratings and the firm's tendency to issue stock in the current or future periods. All of these papers used either a 0-1 variable according to whether there was a subsequent capital issue or not, or looked at the number of external financing transactions. Disclosures, however, are more likely to be related to the actual dollar amount of external financing. Clearly, a firm contemplating a stock issue of a hundred million dollars would have stronger incentives to disclose information (other incentives remaining constant) than another firm contemplating two bond issues of a million dollars each. The more general relationship between disclosures and a firm's need for external financing is examined here in terms of the following (antecedent) hypothesis:

> H7: Voluntary disclosure of information (DISC) is positively associated with the disclosing firm's need for external financing (FINANCE).



PROXIES

Need for external financing

$FINANCE_t^1 = \frac{\text{capital expenditures}_{t+1} - \text{working capital}_t}{\text{total assets}_t}$

$FINANCE_t^2 = \frac{\text{net cash inflow from financing activities}_{t+1}}{\text{total assets}_t}$

Proprietary costs

$PROP^1 = 1$, if $ROA^1 = \frac{\text{income}}{\text{asset}} \geq 0.13$, else $\text{PROP}^1 = 0$

$PROP^2 = 1$, if $\frac{\text{income}+(1\text{-tax rate})\text{interest}}{\text{asset}} \geq 0.14$, else $\text{PROP}^2 = 0$

$PROP^3 = (MVALUE)^2$

$PROP^4$ =sales/sales of top eight firms in the industry

Managerial Ownership

$OWN = \frac{\text{Number of shares owned by the CEO}}{\text{Total number of shares outstanding}}$

Institutional ownership

$INST$ = percentage of common stock held by institutions

Insider trading

$TRADE^1 = \frac{\text{total purchases and sales by insiders}}{\text{total insider holdings}}$

$TRADE^2 = \frac{\text{total purchases and sales by insiders}}{\text{total shares traded during the year}}$

Cost of capital

$COD^1 = \frac{\text{interest expense}}{\text{total liabilities}}$ – t-bill rate

COD^2 = average yield on corporate bonds - t-bill rate

COE = four month ahead monthly stock return

$SPREAD = \frac{2(\text{Ask price - bid price})}{(\text{Ask price + bid price})}$

Controls

$MVALUE$ = market value of common shares

$LIQUID = \frac{\text{current assets}}{\text{total assets}}$

$LEVER = \frac{\text{total liabilities}}{\text{total assets}}$

$STDRETN$ = standard deviation of daily stock return

VOL = average daily trading volume of stocks

$LBEMVAL = \frac{\text{book value of common equity}}{\text{market value of common equity}}$

$LMVAL$ = log of MVALUE

MODEL

$$\begin{cases} DISC_t = a_0 + a_1 MVALUE_t + a_2 FINANCE_t + a_3 PROP_t + a_4 OWN_t + a_5 INST_t + a_6 TRADE_t + \varepsilon \\ COD_{t+1} = b_0 + b_1 DISC_t + b_2 ROA_t^1 + b_3 LIQUID_t + b_4 LEVER_t + b_5 STDRETN_t + \upsilon \\ R_{t+1} = d_0 + d_1 LMVALUE_t + d_2 LBEMVAL_t + d_3 \beta_{t+1} + d_4 DISC + \kappa \\ SPREAD_{t+1} = c_0 + c_1 DISC_t + c_2 VOL_t + c_3 STDRETN_t + \hat{\varepsilon} \end{cases}$$

Figure 3.1
Framework for Hypothesis Development

CHAPTER 4
THE DISCLOSURE VARIABLE

Introduction

The hypotheses discussed in chapter 3 are fairly general in the sense that they should hold for most types of voluntary disclosures. While much of the empirical literature on voluntary disclosures has focused on management forecasts of earnings, there are some potential problems of using management forecasts as the dependent variable in this study. First, the dichotomous nature of this variable (forecast versus no forecast) makes it difficult to examine the degree of cross-sectional variations in disclosures across firms. While a firm making two earnings forecasts may be considered to be releasing more information than another making only one such forecast, it is difficult to draw strong conclusions about the relative disclosure strategies of the two firms. Second, it is not possible to differentiate between firms that are withholding useful information (through nondisclosure) from those that do not have any useful information to disclose. Third, as Lees (1981), Ajinkya and Gift (1984) and others have suggested, firms tend to release a lot of information indirectly through financial analysts. Information (beyond minimum requirements) can also be released through annual reports, quarterly reports and other published material. These important aspects of management disclosures could be ignored if measures of disclosures are based only on management earnings forecasts. To deal with these problems, this study uses an alternative disclosure measure based on evaluations of financial analysts. The nature and characteristics of this disclosure measure is given below.

Description of the Disclosure Scores

The disclosure measure used in this study are disclosure scores obtained from the Corporate Information Committee Report (CICR). Published annually by the Association for Investment Management and Research, the CICR provides detailed evaluations of disclosure practices of roughly 400-600 firms spread over 30-40 industries.[1] Disclosure practices of each industry are evaluated by an average of 10 financial analysts who examine a firm's disclosure efforts through required published materials like the annual report, 10-K, 10-Q, etc.; quarterly reports, segment information and other published information; and other aspects like personal contact with analysts, investor relations, etc.. Based on analysis, scores are assigned to each firm and/or rankings within the industry are provided. Firms receiving the highest score in each industry group is given an award.[2]

The disclosure scores thus provide a useful measure of a firm's overall disclosure efforts. They encompass all aspects of disclosures and represent perceptions of financial analysts--the primary users of financial information. While error or bias in analysts' perceptions could be reflected in the scores, the impact of this is not likely to be serious as the scores are prepared jointly by a group of financial analysts rather than individually. A comprehensive checklist of criteria for evaluating the financial statements provided by the Corporate Information Committee also helps in standardizing the ratings process across industries and minimizing the biases and errors arising from individual judgments of analysts. Results in Lang and Lundholm (1993), Farragher, Kleiman and Bazaz (1994) and this paper indicate that the scores are fair proxies for the asymmetry of information in the market. Lang and Lundholm (1993) find a negative association between the scores

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[1]The report was formerly published by the Financial Analyst Federation, but the Association for Investment Management and Research now combines the functions of the Financial Analyst Federation and the Institute of Chartered Financial Analysts.

[2]The objective of the Association in preparing the reports is to induce firms to disclose more information in a timely manner.

and analyst forecast errors and the standard deviation of stock returns. Similarly, Farragher, Kleiman and Bazaz (1994) document a significant negative relationship between the disclosure scores and dispersion of security analysts' earnings per share forecasts. Moreover, this paper documents a negative association between the scores and the bid-ask spread of the firm. The scores thus seem to correspond to investors', financial analysts' and market makers' perceptions of asymmetry of information.

Apart from being a comprehensive measure of a firm's disclosure efforts, the wide variation of the scores across firms allows for more powerful tests of inter-firm differences in disclosure efforts. Moreover, the CICR provides separate scores to firms based on their annual report disclosures, quarterly and public releases and direct disclosures to financial analysts. Thus, separate tests of management incentives can be performed using each of these disclosure measures. This could not only improve the robustness of the results but also provide insights on whether management incentives differ according to the type of disclosure.

The use of the disclosure scores from the CICR also allow us to examine if a specific type of incentive dominates and has a significant impact on a firm's overall disclosure policy. These could be differentiated from other incentives that could be present in specific situations but may be outweighed by countervailing incentives. The relative importance of these other incentives on a firm's overall disclosure policy may then be limited.

Sample Selection and Characteristics

An examination of the CICR's revealed some variation in the reporting detail across industries. Thus one industry gave only general impressions (above average or below average type of judgment) while another industry reported disclosure scores on 14 separate disclosure categories. Most industries were found to give scores to firms out of a

total of 100 points, and a large proportion of the industries provided scores on three sub-categories:

1. Annual and required published information (annual reports, 10-K's, 10-Q's, etc.).
2. Quarterly stockholder reports and other published materials not always required.
3. Investor relations and related aspects.

For the purpose of this study, disclosure scores are collected for the five-year period 1987-91 from the CICR. Only firms for which disclosure scores out of 100 points on each of the three categories can be obtained are retained. All disclosure scores are thus standardized to a maximum of 100 points.[3] The data is checked carefully against possible errors. Errors detected are corrected whenever possible. Otherwise the observation is deleted. The selection criteria yielded 1,340 disclosure score observations (for each disclosure category) over the five-year period. A total of 410 firms were included at least once during the five year period and 133 firms were included in each of the five years. The sample spans 28 industries over the five year period.

Table 4.1 shows the industry distribution of the disclosure scores. Some industries are combined into one group for some specific years in the CICR. Thus, nonferrous metals and mining are reported separately for 1990 and 1991, but are combined for 1989. The two industries are combined for all years for the purpose of this study.[4] The Table shows that Paper and Forest Products is the largest group with 93 observations, while International Pharmaceutical is the smallest with 7 observations.

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[3]While this criteria eliminated some industries giving only total scores, it may be advantageous for two reasons: (i) results can be obtained from a uniform sample of four types of disclosure scores, and, (ii) industries providing four disclosure scores may have been more carefully analyzed than those with only total scores.

[4]Similarly, oil service and equipment companies and oil and gas drilling companies are combined into oil service and drilling; domestic integrated oil companies and independent refining companies are combined into domestic and refining.

Table 4.2 presents some sample statistics for the four disclosure variables. As the table indicates, the average scores range from 69.37 to 72.97. There is also considerable dispersion in the scores, as represented by the standard deviation, which ranges from 12.71 to 16.18 and the related interquartile range varies from 17.02 to 21.

A general idea about the nature of the disclosure sample can be obtained by looking at Table 4.3.[5] The table reveals that the average year-end market value of common shares of the sample is 4.11 billion dollars. Average daily trading volume is 0.22 million shares and average CEO stock ownership and institutional ownership are 2.07 percent and 52.41 percent respectively. The table also reveals wide variation in market value, ownership and other variables as indicated by the high standard deviation and the related interquartile range of these variables.

The data also reveals wide variation in the scores across industries. Table 4.4 provides some key statistics for the total disclosure scores according to industry. As the table shows, mean scores range from a low of 46.42 (for nonferrous metals and mining) to a high of 82.49 (for health care). Similarly, the standard deviation of the total scores range from a low of 5.47 (motor carrier) to a high of 16.62 (independent oil and gas). Because the firms in each industry are evaluated by a different set of analysts, it is possible that at least part of the difference in the scores of two industries is attributable to differences in scoring procedures used. This could lead to biases if only raw disclosure scores are used without any adjustments. To deal with this problem, following Lang and Lundholm (1993), scores of all firms within an industry are uniformly scaled up or down so that the industry mean coincides with the population mean.[6]

Analysis is performed separately using the four disclosure measures: total disclosure scores, scores on annual reports and required disclosures, scores on quarterly reports and

[5]A complete description of the variables listed in this table are given in chapter 5.

[6]Tests of the hypotheses are also conducted with the raw scores for comparison and the results are provided later.

other public releases, and scores on investor relations. There are two reasons for this. First, all four disclosure scores could be taken as proxies for voluntary disclosures. While scores on annual reports and other required information may have some mandatory component, it should be clear that if they represent only mandatory disclosures, they should not vary across firms. Table 4.2 reveals that standard deviation of disclosure scores on annual reports and required information is 13.66 which is comparable to 16.18 obtained for scores on investor relations which represent voluntary disclosure items only. High correlation between the three types of disclosure scores (ranging from 0.5 to 0.7) also indicates that all scores have similar or overlapping characteristics. Firms can disclose a lot of information voluntarily in the annual and quarterly reports which go beyond the minimum disclosure requirements. These could include clearer discussions of assumptions and judgments involved, early adoptions of accounting standards, clearer projections of future earnings, etc..

Second, the disclosure scores on the three sub-categories may represent different aspects of disclosures. The higher standard deviation of the scores on investor relations (as compared to those of the other two scores) indicates that there may be more noise associated with such disclosures. Direct disclosures to financial analysts may depend more on whether there are unusual economic events taking place, whether the firm management feels that the firm's stock is significantly undervalued, etc.. If firm managers want to release information to the general public, disclosures through annual reports may be more effective than indirect disclosures through financial analysts. Examining the discussions in the CICR, it is clear that high disclosure scores are often attributable to clearer and more comprehensive quarterly reports and a good investor relations program. Therefore, it is useful to examine the scores on the sub-categories as well as the total disclosure score. Tests of the hypotheses may also prove to be more robust if the results are supported for all disclosure scores.

The correlations between the independent and dependent variables are given in Table 4.5. The numbers are discussed in Chapter 6.

Hypotheses Testing in the Context of "Good News" versus "Bad News"

One potential concern, when testing for management's disclosure incentives using the disclosure scores, is that the scores do not allow for differentiating between "good news" and "bad news" disclosures. It could be argued that some management incentives differ according to whether a disclosure is considered to be good news or bad news. While this is true, in the context of most of the hypotheses to be tested in this study, the incentives tend to work in the same direction for both good news and bad news. Thus, when insider trading is concerned, firm managers can profit from withholding both good news and bad news and trade accordingly. Similarly, firms with large institutional ownership would be under pressure to release both favorable and unfavorable information. In terms of proprietary costs, firms facing such costs may have incentives to withhold bad news as well as good news if competing firms can use both types of information to their advantage. Market makers who set the bid-ask spread of a stock may maintain a large spread if they believe that traders have private information, irrespective of whether they expect traders to possess good news or bad news. When the relationship between disclosures and the cost of capital is concerned, however, management's incentives for disclosures could differ according to whether the information to be released is considered to be good news or bad news by the market. Clearly a firm releasing bad news could actually end up with a higher cost of debt and equity. Some tests were performed to control for this possibility and these are discussed in chapter 6.

The distinction between good news and bad news may not be critical when disclosures are proxied by the scores in the CICR. A careful examination of the CICR's indicated that differences in the disclosure scores across firms generally arise from

differences in the detail and clarity of the information presented. One firm, for example, could receive a higher score than another if it provided more detailed segment information and had clearer and more frequent discussions with financial analysts. In this situation, investors of the high disclosure firm would have more information to estimate future earnings more precisely. This in turn may be reflected in a lower dispersion in investors' expectations. Thus, unlike management earnings forecasts, which tend to change both investor's perceptions about the level of future earnings as well as the precision of their predictions, the disclosure scores tend to be reflected more in the precision of investors' expectations. The issue of whether disclosures are good news or bad news may thus not be important when disclosures are proxied by the disclosure score.

Table 4.1
Industry distribution of the sample of disclosure scores

INDUSTRY	Total number of firms examined in					
	1987	1988	1989	1990	1991	TOTAL
Aerospace	11	11	11	11		44
Airline	11	11	11	8	8	49
Apparel	10	10	12	12	12	56
Chemical	12	17	18	17	16	80
Construction		10	12	12		34
Container and Packaging		10	10	10	11	41
Diversified Companies	8	11	11	13	12	55
Electrical Equipment	11	11	10	11	12	55
Food, Beverage & Tobacco			27	26	29	82
Health Care	18	18	17	17	17	87
Health Care Services	8					8
International Pharmaceutical					7	7
Machinery	17	17	16	16	16	82
Media[1]	16	15	21	20	20	92
Motor Carrier				9		9
Natural Gas Distribution	10	11	11	10	10	52
Natural Gas Pipelines	14	13	13	13	13	66
Nonferrous Metals & Mining[2]			15	19	14	48
Precious metals				17	12	29
Paper and Forest Products	17	20	18	19	19	93
International oil companies	7	7			7	21

Table 4.1--continued

INDUSTRY	Total number of firms examined in					
	1987	1988	1989	1990	1991	TOTAL
Oil - Domestic and Refining		10	10	12	12	44
Independent Oil and Gas	9	10	10		9	38
Oil - Service & Drilling[3]	8	8				16
Railroad	8	8	7	7	8	38
Savings Institutions			6	7		13
Specialty Chemical		20	21	18	16	75
Textiles	5	5	5	5	6	26
TOTAL	200	253	292	309	286	1340

[1]The Media Industry was called Publishing and Broadcasting in 1987-88.
[2]Nonferrous Metals and Mining were treated as separate industries in 1990-91 but were combined in 1987-89. The two groups are combined here.
[3]Oil Service and Equipment, and, Oil and Gas Drilling were treated as separate industries in 1990-91 but were combined in the other years. The two groups are combined here.

Table 4.2
Descriptive statistics of the disclosure variables

Disclosure type	STATISTICS								
	N	MEAN	MIN	MAX	STD	10%	25%	75%	90%
Annual reports	1340	70.15	16.29	96.00	13.66	51.00	60.97	81.01	86.00
Quarterly and other	1340	69.37	8.67	100.00	15.08	49.89	60.00	80.00	88.00
Investor relations	1340	72.97	12.50	100.00	16.18	51.20	64.00	85.00	90.43
Total score	1340	70.57	23.20	96.30	12.71	53.20	63.10	80.12	85.20

The reported statistics are based on scores firms received out of a total of 100 points.

Table 4.3
Descriptive statistics of the incentive and control variable

Variable	N	MEAN	MIN	MAX	STD	10%	25%	75%	90%
OWN	1268	2.07	0.00	80.50	7.35	0.02	0.06	0.77	4.44
INST	1286	52.41	0.00	92.00	17.78	26.00	42.00	66.00	72.00
TRADE[1]	958	0.41	0.00	101.06	3.89	0.00	0.004	0.08	0.22
TRADE[2]	1027	0.01	0.00	2.43	0.08	0.00	0.0001	0.003	0.01
FINANCE[1]	1119	-0.05	-0.62	0.84	0.17	-0.29	-0.16	0.06	0.14
FINANCE[2]	1209	-0.01	-0.59	1.62	0.13	-0.11	-0.06	0.02	0.08
PROP[4]	1308	0.058	0.00	0.93	0.08	0.005	0.01	0.07	0.14
COD[1]	1291	-0.02	-0.08	0.07	0.02	-0.05	-0.03	-0.002	0.01
COD[2]	456	0.03	-0.08	0.12	0.02	0.01	0.02	0.04	0.05
SPREAD	977	0.009	0.001	0.06	0.008	0.003	0.004	0.01	0.02
ROA	1316	0.06	-0.54	0.57	0.07	-0.01	0.02	0.08	0.13
MVALUE	1301	4.11	0.03	75.61	7.28	0.30	0.69	4.36	9.59
LEVER	1316	0.60	0.10	1.93	0.17	0.41	0.50	0.69	0.79
LIQUID	1230	0.37	0.03	0.88	0.18	0.16	0.23	0.51	0.61
STDRETN	1237	0.02	0.007	0.07	0.007	0.01	0.02	0.02	0.03
VOL	1237	0.22	0	2.29	0.25	0.03	0.06	0.3	0.52

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. TRADE[1] represents the ratio of total open market purchases and sales of insiders to total insider holdings. TRADE[2] represents the ratio of total open market purchases and sales of insiders to total shares traded by all investors. FINANCE[1] is given by (future period capital expenditures - current period working capital)/(current period assets). FINANCE[2] is ratio of future period net cash inflow from financing activities to current period total assets. PROP[4] is the ratio of total sales of the firm to total sales of the top eight firms in the two-digit industry code. COD[1] is the ratio of interest expense to total liabilities net of the t-bill rate, while COD[2] is the average monthly yield on bonds over the year subsequent to

Table 4.3--continued

disclosures, net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in $1000 million). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year.

Table 4.4
Descriptive statistics of the total disclosure score, by industry

INDUSTRY	STATISTICS						
	N	MEAN	MIN	MAX	STD	25%	75%
Aerospace	44	70.98	56	85.50	8.29	65.45	77.95
Airline	49	71.88	39.80	86.10	10.81	64.70	79.30
Apparel	56	67.16	27.00	87.00	10.36	61.00	74.00
Chemical	80	73.05	47.79	96.30	11.28	64.86	81.30
Construction	34	79.20	68.74	94.46	5.73	75.53	83.27
Container and Packaging	41	61.41	27.60	82.20	9.75	56.40	67.10
Diversified Companies	55	79.95	52.02	90.31	7.22	76.30	85.32
Electrical Equipment	55	78.39	62.30	88.70	5.96	75.70	82.80
Food, Beverage & Tobacco	82	70.73	25.00	87.00	11.82	66.60	78.20
Health Care	87	82.49	69.00	93.00	6.47	79.00	87.00
Health Care Services	8	66.00	52.20	75.60	7.60	61.60	70.55
Independent Oil and Gas	38	58.90	27.03	82.80	16.62	43.60	73.93
International Oil companies	21	62.96	48.52	72.88	6.96	57.3	68.98
International Pharmaceutical	7	66.14	52.00	83.00	11.20	54.00	73.00
Machinery	82	72.87	46.00	89.70	9.95	66.50	81.40
Media	92	65.87	36.80	85.40	11.12	58.00	75.90
Motor Carrier	9	77.29	71.30	89.10	5.47	73.30	79.60
Natural Gas Distribution	52	80.24	60.60	93.40	6.40	75.85	83.85
Natural Gas Pipelines	66	74.00	56.90	89.80	7.82	68.30	79.00
Nonferrous Metals & Mining	48	46.42	23.2	70.40	11.00	40.55	53.80
Oil - Domestic and Refining	44	79.51	51.20	91.60	9.22	76.15	86.15
Oil - Service and Drilling	16	60.31	39.63	82.63	11.45	55.17	67.35
Precious Metals	29	56.77	38.60	74.20	8.99	51.90	63.50
Paper and Forest Products	93	65.13	37.50	85.40	9.36	60.50	70.90
Railroad	38	80.68	60.0	95.30	9.55	77.00	88.50
Savings Institutions	13	80.85	73.00	92.00	6.22	75.50	85.00
Specialty Chemical	75	63.61	27.80	81.00	9.90	59.80	70.00
Textiles	26	69.35	50.00	87.00	11.36	61.00	79.00

Table 4.5
Correlation between the dependent and independent variables
(p-values for two-tailed test given in parentheses)

	MVALUE	FINANCE[1]	PROP[1]	OWN	COD[1]	COD[2]	ROA[1]	INST	STDRETN	SPREAD	LEVER	LIQUID	VOL	TRADE[1]
MVALUE	1.0 (0.0)													
FINANCE[1]	0.091 (0.004)	1.0 (0.0)												
PROP[1]	0.238 (0.0001)	-0.127 (0.0001)	1.0 (0.0)											
OWN	-0.104 (0.0001)	-0.116 (0.0002)	-0.023 (0.417)	1.0 (0.0)										
COD[1]	-0.082 (0.003)	0.06 (0.047)	-0.184 (0.0001)	0.108 (0.0001)	1.0 (0.0)									
COD[2]	-0.246 (0.0001)	-0.058 (0.26)	-0.028 (0.554)	0.216 (0.0001)	0.487 (0.0001)	1.0 (0.0)								
ROA[1]	0.236 (0.0001)	-0.144 (0.0001)	0.637 (0.0001)	-0.026 (0.349)	-0.328 (0.0001)	-0.209 (0.0001)	1.0 (0.0)							
INST	-0.027 (0.335)	-0.094 (0.0021)	-0.036 (0.197)	-0.17 (0.0001)	-0.09 (0.0011)	0.039 (0.402)	0.017 (0.54)	1.0 (0.0)						
STDRETN	-0.221 (0.0001)	-0.007 (0.812)	-0.038 (0.181)	0.156 (0.0001)	0.207 (0.0001)	0.381 (0.0001)	-0.234 (0.0001)	-0.135 (0.0001)	1.0 (0.0)					
SPREAD	-0.307 (0.0001)	-0.08 (0.021)	-0.047 (0.143)	0.23 (0.0001)	0.225 (0.0001)	0.357 (0.0001)	-0.17 (0.0001)	-0.292 (0.0001)	0.411 (0.0001)	1.0 (0.0)				
LEVER	-0.051 (0.067)	0.338 (0.0001)	-0.2 (0.0001)	0.021 (0.448)	0.354 (0.0001)	0.249 (0.0001)	-0.349 (0.0001)	-0.034 (0.225)	0.089 (0.0017)	-0.009 (0.791)	1.0 (0.0)			
LIQUID	0.022 (0.454)	-0.79 (0.0001)	0.24 (0.0001)	0.095 (0.0011)	-0.19 (0.0001)	-0.001 (0.98)	0.236 (0.0001)	0.129 (0.0001)	0.062 (0.036)	0.046 (0.168)	-0.203 (0.0001)	1.0 (0.0)		

Table 4.5--continued

	MVALUE	FINANCE^1	PROP^1	OWN	COD^1	COD^2	ROA^1	INST	STDRETN	SPREAD	LEVER	LIQUID	VOL	TRADE^1
VOL	0.645 (0.0001)	0.16 (0.0001)	0.137 (0.0001)	-0.13 (0.0001)	-0.04 (0.168)	-0.111 (0.021)	0.083 (0.0035)	0.01 (0.719)	0.062 (0.028)	-0.18 (0.0001)	0.074 (0.009)	-0.046 (0.122)	1.0 (0.0)	
TRADE^1	-0.019 (0.553)	0.031 (0.389)	-0.022 (0.49)	-0.01 (0.748)	0.013 (0.699)	0.012 (0.807)	-0.054 (0.096)	-0.04 (0.214)	0.017 (0.611)	0.01 (0.762)	0.042 (0.194)	-0.015 (0.659)	0.128 (0.0001)	1.0 (0.0)
DISC (TOT)	0.031 (0.257)	0.124 (0.0003)	-0.081 (0.003)	-0.136 (0.0001)	-0.058 (0.04)	-0.134 (0.0042)	-0.002 (0.941)	0.129 (0.0001)	-0.059 (0.037)	-0.138 (0.0001)	0.023 (0.4)	-0.081 (0.004)	0.014 (0.635)	-0.029 (0.372)

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. TRADE^1 represents the ratio of total open market purchases and sales of insiders to total insider holdings. TRADE^2 represents the ratio of total open market purchases and sales of insiders to total shares traded by all investors. FINANCE^1 is given by (future period capital expenditures - current period working capital)/(current period assets). PROP^1 = 1 if ROA^1 $\geq$ 0.13, otherwise PROP^1 = 0. COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate, while COD^2 is the average monthly yield on bonds over the year subsequent to disclosures, net of the t-bill rate. ROA^1 is the ratio of net income to total assets while ROA^2 is the ratio of gross income (net income untaxed interest income) to total assets. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in $1000 million). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC (TOT) = mean adjusted total disclosure score.

CHAPTER 5
RESEARCH METHODOLOGY

Introduction

This chapter describes the research method used to test the hypotheses discussed in chapter 3. Based on three broad types of incentives, a number of factors were identified which could potentially be linked to management's disclosure strategies. Five of these are considered to be antecedent to disclosures: (i) insider trading (TRADE), (ii) managerial stock ownership (OWN), (iii) institutional ownership (INST), (iv) proprietary costs (PROP), and (v) need for external financing (FINANCE). The argued consequence of disclosures is a lower cost of capital (COC) for the disclosing firm. This consists of a number of components including cost of debt (COD), cost of equity (COE) and the bid-ask spread (SPREAD) (which could be considered as a component of the cost of equity).

The antecedent incentives are examined jointly in the form of the following equation:

$$DISC_t = f(TRADE_t, OWN_t, INST_t, PROP_t, FINANCE_t, CONTROL_t) \quad (1)$$

where DISC refers to the disclosure proxies (discussed in Chapter 4) and CONTROL refers to control variables included in the equation (to be specified below).

The consequent incentives, on the other hand, are tested by linking the disclosures of the current period to the various components of cost of capital in the period *subsequent* to disclosures. Thus the proper specification for the tests of these incentives are:

$$COD_{t+1} = f(DISC_t, CONTROL_t) \quad (2)$$

$$COE_{t+1} = f(DISC_t, CONTROL_t) \quad (3)$$

$$SPREAD_{t+1} = f(DISC_t, CONTROL_t) \quad (4)$$

The exact empirical specification of each of these equations along with the definitions of the incentive and control variables are provided below.

Test of the Antecedent Incentives

To discuss the empirical specification of equation (1), the proxies for the antecedent incentives have to be defined.

Insider Trading (TRADE)

The literature on insider trading does not suggest a universally accepted measure of insider trading activity. For event studies where the direction of insider trades can be predicted (e.g., net selling prior to bankruptcy), net open market purchases or sales are often considered as appropriate measures of insider trading activity. This measure, however, is not suitable for this study since the total disclosure score refers to the overall disclosure efforts for the full year. Thus, it is possible that insiders engage in net selling in one month and net purchases in another and these would not be captured by the net sales measure. To deal with this problem two measures representing gross or aggregate volume of insider trading activity (in terms of total number of shares transacted) are considered:

$$TRADE^1 = \frac{P_i + S_i}{HO_i} \tag{5}$$

$$TRADE^2 = \frac{P_i + S_i}{ST_i} \tag{6}$$

where P_i = total number of common shares purchased by insiders of firm i during a year.

S_i= total number of common shares sold by insiders of firm i during a year.

HO_i= aggregate holdings of common stock of all insiders of firm i during a year.

ST_i = number of common shares of firm i traded during the year.

Data on insider trading is obtained from the Ownership Reporting System (ORS) tape compiled by the Securities and Exchange Commission. This tape is based on reports

filed with the SEC by insiders on their trading activities during the period July 1987 to March 1991. It provides a large variety of information on insider trading and holdings including information on the number of shares bought and sold, the date of the transaction, the stock price at which the transactions took place, other descriptive information on the nature of the transactions, and the stock holdings of the insiders. Insider stock holding figures are cross-checked with figures from Spectrum 6 annual volumes published by CDA Investment Technologies Inc. Following much of the literature on insider trading, only open market purchases and sales are used in the calculation of the measures of insider trading, as other types of trades could be driven by liquidity or other considerations.

Management Ownership (OWN)

A company's board of directors and top officials generally play an important role in all of corporate decisions including disclosure decisions. Among this group, the company CEO is likely to have the maximum impact on such decisions. The potential impact of CEO stock ownership on a firm's disclosure decisions is considered here in terms of the following ratio:

$$OWN = \frac{\text{Number of common shares held by the CEO}}{\text{Total number of common shares outstanding}} \tag{7}$$

Data on stock ownership of the CEO is obtained partly from secondary sources like FORBES compensation surveys and partly from proxy statements.

Institutional Ownership (INST)

The institutional ownership variable is defined as:

$$INST = \frac{\text{Number of common shares held by institutions}}{\text{Total number of common shares outstanding}} \tag{8}$$

Data on institutional ownership is collected from Moody's Stock Price Guides.

Proprietary Cost (PROP)

Proprietary costs could be of various types so that it is important to use a proxy that captures most of these types. Scott (1994) used three different proxies: strike incidence, wage rate, and return on assets as compared to industry, to capture potential proprietary costs arising from the labor market. Proprietary costs, however, could arise from actions of other firms in terms of increased competition, potential entry, etc.. Firm managers are also likely to consider political costs arising from threat of regulation or sanctions for possible antitrust violations while making their disclosure decisions. The monopoly power of a firm could be a measure of these types of proprietary costs. A firm operating in an oligopolistic market could be significantly affected by actions of other firms in the industry and also by entry of new firms into the industry.[1] The threat of regulation also could be high in this situation. In this case the proprietary costs of disclosing information may be quite high. For a firm operating in a perfectly competitive environment, on the other hand, the impact of the action of other firms in the industry on its own profits is likely to be low.

Monopoly power of a firm could be measured by the rate of return it generates. Clearly, a firm generating abnormal economic rent could attract the attention of regulatory authorities, competing firms, and, potentially new firms. Based on this notion two proxies are suggested:[2]

$$ROA_t^1 = \frac{\text{income}_t}{\text{total assets}_t} \tag{9}$$

$$ROA_t^2 = \frac{\text{income}_t + (1 - \text{tax rate}_t)\text{interest}_t}{\text{total assets}_t} \tag{10}$$

[1]Of course, if an operating firm is a natural monopoly, there would be no threat of entry. Entry could also be restricted by regulation, patents etc.. The sample under consideration excludes natural monopolies and regulated industries so that threat of entry could be a real concern for the firms in this sample.

[2]Ahmed (1994) had used similar proxies for measuring a firm's product market competition.

where, $tax\ rate = \frac{\text{tax expense}_t}{\text{pretax income}_t}$

The second measure differs from the first to the extent that it includes the interest expense (net of taxes) as return to debt holders. ROA^2 thus measures total return accruing to both equity holders and debt holders.

With proprietary costs being measured in terms of return to assets, it should be clear that such costs become significant only after the return reaches some critical level. A firm earning a 6 percent return may not have significantly higher proprietary costs as compared to one earning a 4 percent return simply because the returns on both may be too small to lead to such costs. Thus, a linear relationship between disclosures and proprietary costs is not hypothesized. Instead, a 0-1 variable is used where proprietary costs are taken to be 1 for firms lying in the top 10 percentile (based on ROA^1 or ROA^2) and 0 for other firms. The measures of proprietary costs used for empirical testing then are

$$PROP^1 = 1 \text{ if } ROA^1 \geq 0.13, \quad 0 \text{ otherwise} \tag{11}$$

$$PROP^2 = 1 \text{ if } ROA^2 \geq 0.14, \quad 0 \text{ otherwise} \tag{12}$$

The 10 percent cutoff point used here may be somewhat arbitrary and is discussed in more detail in chapter 6.

An alternative to the cutoff approach is to use a nonlinear equation in a size variable. Clearly when firm size becomes vary large, proprietary costs tend to become significant. Larger firms, on the other hand, are likely to face greater demand pressure from investors to disclose information. Hence it is possible that disclosures could be increasing in size over a certain range but decreasing when size becomes very large (and proprietary costs become very high). This could be tested for by using a second degree polynomial of the market value of the firm MVALUE. The hypothesis would imply a negative coefficient of the squared term. Thus, a third alternative measure of proprietary costs is given by:

$$PROP_t^3 = (\text{MVALUE}_t)^2. \tag{13}$$

Monopoly power or proprietary costs of a firm could also be proxied by its market share. Firms with large market share are likely to be operating in an oligopolistic market where the actions of competing firms could have a significant impact on the sales and profits of this firm. These firms would thus like to maintain their advantage by withholding information the competitors could use to their benefit. The market share based measure of a firm's proprietary costs of a firm can be given by:

$$PROP^4 = \frac{\text{total sales of firm i}}{\text{total sales of the largest eight firms in the industry}} \qquad (14)$$

Industry is defined by two-digit SIC codes. An alternative measure using only top five firms in the industry was also used but yielded very similar results.

While proprietary costs measured by market share seems to be intuitively appealing, note that such a measure makes sense only when product-wise comparisons are made. For multi-product firms, $PROP^4$ may not adequately reflect monopoly power. For widely diversified firms $PROP^4$ may be a size measure. Given that a large proportion of the firms in the sample are multi-product firms, the results using this proxy should be interpreted with caution.

All proprietary cost variables are calculated from COMPUSTAT data.

Need for External Financing (FINANCE)

Previous research looking at the possible impact of a firm's disclosure decisions on its financing needs has generally considered the number or frequency of external financing decisions.[3] The actual dollar amount of the financing, however, is likely to be a more important factor in a firm's disclosure decisions. To capture this a proxy a firm's expected aggregate dollar value of external financing is derived here. If firms are to affect their financing costs through disclosures, such disclosures should be made prior to undertaking

[3]See Ruland, Tung and George (1990), Lang and Lundholm (1993), and Frankel, McNichols and Wilson (1995).

their fund raising activities. It is thus likely that firms will make their disclosure decisions based on their (expected) future financing needs. A firm estimating its period t+1 "need" for external financing may then compare its stock of current assets at the beginning of the period to its expected obligations (proxied by the current liabilities balance) and expected (planned) investments for period t+1.[4] Expected investments of the future period is proxied by next period's capital expenditures which is assumed to be known with certainty in the current period. In this case an appropriate relative measure of a firm's financing needs could be given by:[5]

$$FINANCE^1_t = \frac{\text{capital expenditures}_{t+1} + \text{current liabilities}_t - \text{current assets}_t}{\text{total assets}_t} \qquad (15)$$

With cash flow data becoming available from 1987, an alternative measure of a firm's "need" for external financing is to examine the actual cash flow from financing activities. Thus a second possible measure of the firm's financing needs could be

$$FINANCE^2_t = \frac{\text{net cash inflow from financing activities}_{t+1}}{\text{total assets}_t} \qquad (16)$$

The second proxy may seem to be better than the first one as it focuses on actual financing transactions. However, there are a number of drawbacks of using this measure. First, if financing costs are to be affected by disclosures such disclosures have to be made prior to the financing transactions. Hence disclosures may correspond to planned financing needs rather than the actual amount of financing. Second, firms with large current period borrowings may also have large interest payments and debt repayments arising from past borrowings. These are subtracted out of cash borrowings to arrive at the

[4]It is assumed here that the firm can and does liquidate its current assets as needs arise. On the other hand, fixed assets in place are generally not liquidated for financing, either because of anticipated losses on sale due to their limited liquidity or because of their use in the production process.

[5]Future cash flow from operating activities may have a lot of uncertainty associated with them so that firms may not wish to depend on it to make future capital expenditure decisions.

net financing figure. Thus some firms may show a relatively low value of FINANCE2 just because their payments are also high.[6]

Data for calculation of FINANCE1 and FINANCE2 is obtained from COMPUSTAT.

Control Variable (MVALUE)

In designing the tests for the consequent incentives, it is important to control for possible size effects. For the purpose of this study, size is measured by MVALUE representing the market value of a firm's common shares in billion dollars at the end of the disclosure year. Lang and Lundholm (1993) found a positive relationship between disclosure scores and beginning of the year market value.

The empirical specification for equation (1) then is:

$$DISC_t = a_0 + a_1 MVALUE_t + a_2 FINANCE_t + a_3 PROP_t + a_4 OWN_t + a_5 INST_t + a_6 TRADE_t + \varepsilon \qquad (17)$$

The expected signs of the coefficients are : $a_1>0$, $a_2>0$, $a_3<0$, $a_4<0$, $a_5>0$, and $a_6<0$.

Tests of the Consequent Incentives

As hypotheses H6 and H7 argued, disclosures can lead to a lower cost of capital for the disclosing firm. Three components of cost of capital: (i) cost of debt (COD), (ii) cost of equity (COE), and (iii) bid-ask spread (SPREAD) are identified here. Disclosure, however, is not the only determinant of a firm's cost of capital so that control variables are especially important for testing disclosure incentives in the context of each of these proxies. Moreover, the type of control variables used depend on the nature of the cost of capital proxy. Thus the empirical specification of the tests depend on the type of proxy used. The incentive and control variables used are defined separately for the three components of the cost of capital.

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[6]COMPUSTAT does not provide separate data on cash borrowings and cash repayments.

Tests of the Cost of Debt (COD) Hypothesis

A firm making disclosure decisions is likely to consider the possible impact of such disclosures on its cost of raising debt. One possible proxy for a firm's cost of debt could be its average borrowing costs given by the ratio of interest expense to total liabilities. Given that observations of different years are combined in the sample, it is likely that this measure will be affected by year-to-year fluctuations in the riskfree rate of interest. To control for this, the average annual interest rates on 3-month treasury bills are deducted from the firm's borrowing cost. Thus the following measure is used:

$$COD_t^1 = \frac{\text{interest expense}_t}{\text{total liabilities}_t} - \text{(interest on 3-month t-bills)} \qquad (18)$$

Data for the calculation of COD^1 was obtained from COMPUSTAT.

While COD^1 is a measure of a firm's aggregate cost of debt, there could be two potential problems with this measure. First, it is based on interest on both short term and long term borrowings. If long term borrowings comprise of a large part of the firm's total borrowings, changes in a firm's disclosure strategy from one year to another may not be adequately reflected in COD^1. Second, COD^1 includes bank interest. It may be argued that banks can acquire information directly from companies they invest in. In that case the interest they charge may not be directly related to a firm's disclosure strategy. To deal with these potential problems an alternative measure is suggested based on bond returns:

COD^2 = average monthly yield on bonds over the firm's fiscal year

- treasury bill rate. (19)

Although, theoretically, COD^2 seems to be a better measure of cost of debt as compared to COD^1, Table 4.5 reveals that the two measures have a correlation of 0.48. This suggests that both measures have similar characteristics.

Bond yield data for the calculation of COD^2 is obtained from WARGA fixed income data base. This database created by the Fixed Income Research Program at the University of Wisconsin-Milwaukee contains comprehensive bond information including data on bond ratings, returns, call and put prices, maturity, and duration. The database used had monthly information for the period 1973-91. Thus COD^2 could not be calculated for 1992 (which could have been matched with this study's 1991 disclosure data).

For tests of the cost of debt hypothesis four control variables are included.[7] To control for the effects of risk on COD (i.e., COD^1 and COD^2), a measure of day-to-day fluctuations in stock returns STDRETN is included. STDRETN is calculated as the standard deviation of daily stock returns over the company's fiscal year. With STDRETN measuring the riskiness of the stock, it is expected that the higher the variation in returns the higher the firm's cost of debt. To control for the effects of firm profitability on COD, net return on assets of the disclosure year (ROA^1 as measured in equation 9) is used as another control variable. Lenders may look at past profitability of the firm in estimating its future profitability and its ability to generate cash to pay back the debt. COD is also likely to depend on the amount of leverage the company has, and is measured by:

$$LEVER = \frac{\text{total liabilities}}{\text{total assets}} \tag{20}$$

Firms with high leverage are likely to experience a higher cost of debt.

Lastly, to control for the effects of asset liquidity on COD the following control variable is also included:

$$LIQUID = \frac{\text{current assets}}{\text{total assets}} \tag{21}$$

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[7]The literature on the financial determinants of bond ratings was reviewed to isolate potential determinants of a firm's cost of debt. The control variables used here are those that Horrigan [1966], Kaplan and Urwitz [1979] and others have identified as important determinants of the bond ratings process.

Firms with high values of LIQUID may enjoy greater flexibility in converting assets to cash in order to meet their payment obligations. This may cause firms with higher values of LIQUID to enjoy a lower cost of debt.

The empirical specification of the test of the cost of debt hypothesis is:

$$COD_{t+1} = b_0 + b_1 DISC_t + b_2 ROA^1_t + b_3 LEVER_t + b_4 LIQUID_t + b_5 STDRETN_t + \varepsilon'' \quad (22)$$

The expected signs of the coefficients are: $b_1<0$, $b_2<0$, $b_3>0$, $b_4<0$, and $b_5>0$.

Tests of the Cost of Equity (COE) Hypothesis

The cost of equity of a firm could be proxied by the expected return of the firm obtained from the market model or CAPM regressions. Fama and French (1992) demonstrated, however, that the relationship between average return and risk hypothesized by the Sharpe-Lintner-Black capital asset pricing model disappears during the 1963-1990 period. In fact, they observed that cross-sectional variation in expected returns can be much better explained by a size variable represented by the market value of the firm's common stock and the ratio of the book value of the firm's common equity (BE) to its market value (ME). Their findings thus suggest that risk has two components: a size based component represented by market value of stocks, and the ratio of BE and ME. Fama and French (1995) argued further that BE/ME is related to long term profitability of a firm. Thus high BE/ME firms are typically less profitable than the low BE/ME firms.

If disclosures are to impact a firm's cost of capital, it is expected that firms with higher disclosure scores in period t would enjoy a lower stock return in period t+1, after controlling for market risk as given by the two factors identified by Fama and French (1992). The market beta's are also included as an additional control variable as Kothari, Shanken and Sloan (1995) indicated that this variable is significant when betas are calculated from annual returns data. The following regression is thus suggested:

$$COE_{t+1} = R_{t+1} = d_0 + d_1 LMVALUE_t + d_2 LBEMVAL_t + d_3 \beta_{t+1} + d_4 DISC_t + e''' \quad (23)$$

where,

$$LMVALUE_t = \ln(\text{market value of the firm's common equity in period t}) \quad (24)$$

$$LBEMVAL_t = \ln\left(\frac{\text{book value of the firm's common equity in period t}}{\text{market value of the fir's common equity in period t}}\right) \quad (25)$$

β represents the market beta, and DISC refers to the disclosure scores. The timing of the calculation of the variables is important and is described as follows. Market value and book value of equity for disclosure year t are calculated as of the end of the firm's fiscal year. The return of the firm (R) refers to the cumulative return of the firm calculated from daily stock returns data for the one month period starting four months after its fiscal year end. Thus, for example, for firms with fiscal year ending on December 31, 1987, returns cumulated over the month of May 1988 are regressed against the disclosure scores of 1987 with LMVALUE and LBEMVAL measured using 1987 fiscal year-end data. The four month lag used for calculating the returns is to ensure that all disclosures, including annual reports, have been made public before the returns are calculated. The returns are cumulated over a one month period to avoid possible contamination of the results from "abnormal" stock price behavior on certain days.

The β's used in the regressions are calculated from daily stock price data by running the following market model regression for firm i:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t} \quad (26)$$

where $r_{m,t}$ refers to the return on the equally weighted market portfolio. The coefficients are obtained from regressions using daily returns data for the full fiscal year t+1 and the β_{t+1} thus calculated is used with disclosure scores of year t in equation (23).

Tests of the cost of capital hypothesis using the cost of equity (COE) measure requires that $d_4<0$ in equation (23). Regarding the control variables, Fama and French suggests that $d_1<0$, $d_2>0$ and $d_3>0$.

Data needed to run regressions (23) and (26) are obtained from COMPUSTAT and CRSP.

Tests of the Bid-Ask Spread (SPREAD) Hypothesis

For tests of the bid-ask spread hypothesis, the relative spread of a firm is given by:

$$SPREAD = \frac{2(\text{ask price} - \text{bid price})}{\text{ask price} + \text{bid price}} \tag{27}$$

Data on bid and ask prices for the NYSE firms are obtained from Francis Emory Fitch Inc.. Bid and ask prices for OTC firms are collected from CRSP. Data on the few AMEX firms in the sample could not be obtained.

To test the hypothesized relationship between disclosure scores and the bid-ask spread, the spread should be calculated *subsequent* to all disclosures of the fiscal year, including annual reports. Given that different firms release their annual reports on different dates, consequently the spread data will have to be obtained for a large number of dates to keep the time period matched. Francis Emory Fitch Inc. sells data by the day with the full list of NYSE firms included for that particular day. The costs were thus too high to match each firm's annual report release date with spread data. Instead, data were obtained for every Wednesday in the month of May for years 1988-91.[8] Disclosure scores appearing in the reports for any particular year were then matched with the average spread calculated over the five (or four) Wednesdays of May of the subsequent year. Francis Emory Fitch Inc. discontinued collecting spread data from 1992 so that 1991's disclosure scores could not be included in the tests of the bid-ask spread hypothesis. The month of May was selected as the appropriate period based on the fact that a major proportion of the firms in the sample are calendar year firms so that their annual reports are likely to be

[8]Data on Wednesday May 25, 1988 could not be obtained so that it was substituted by Thursday May 26, 1988.

released by that time. The spread is averaged over the four or five day period to reduce the impact on the spread of specific events taking place on the selected days. Wednesday was selected to avoid possible biases arising from special trading patterns observed during the beginning and end of the week.[9]

To look at the effect of disclosures on a firm's bid-ask spread, it is necessary to control for factors that have been shown to affect the spread. Existing literature on bid-ask spread indicates that trading volume and price variations are significantly correlated with the spread. Thus, Copeland and Galai (1983) and Karpoff (1986) showed that an inverse relationship exists between the spread and trading volume. Similarly, Morse and Ushman (1983) found a statistically significant positive relationship between the spread and variation in stock prices. To deal with these possibilities, two control variables are included: VOL representing the average daily trading volume of the firms calculated over the firm's fiscal year, and STDRETN representing the standard deviation of stock returns as defined previously.

The empirical specification for the test of the bid-ask spread hypothesis then is

$$SPREAD_{t+1} = c_0 + c_1 DISC_t + c_2 VOL_t + c_3 STDRETN_t + \varepsilon'''' \tag{28}$$

The expected signs of the coefficients are: $c_1<0$, $c_2<0$, and, $c_3>0$.

Simultaneous Testing of all Incentives

Initially the hypotheses are tested by running the four regressions (17), (22), (23) and (28) separately. The antecedent factors are thus tested jointly by running regression (17) while the consequent incentives are examined through equations (22), (23) and (28). Looking at the equations, however, it is clear that the antecedent factors affecting

[9]There is extensive literature documenting day-of-the-week effects on stock returns and trading patterns. This could have an impact on bid-ask spreads observed during the early and later part of the week. See French [1980], Gibbons and Hess [1981], Lakonishok and Levi [1982], Keim and Stambaugh [1984], among others, for a discussion of the day-of-the-week effect.

disclosures in turn affect the components of the cost of capital. On the other hand firm managers take cost of capital into consideration when making disclosure decisions. In fact, firm managers are likely to weigh all costs and benefits of disclosures simultaneously in order to determine the right disclosure strategy. Hence disclosures and the components of the cost of capital would be simultaneously determined by the antecedent and consequent incentive variables.

Given that the model specified in terms of equations (17), (22), (23) and (28) are simultaneously determined, separate OLS estimates of each equation may yield inconsistent parameter estimates. This can be understood by examining the empirical specification of the four equations. Separate tests of the hypotheses in the form of the four independent regressions implicitly assume that the variables in one equation are independent of the error terms of the other equations. This, however, is not true in the context of this model. Thus, for example, a positive value of ε' in equation (17) has a positive impact on disclosures which in turn affect the dependent variables of the other equations. The four equations are thus interdependent. In this framework, the separate OLS estimates would yield estimates that are not consistent. That is, parameter estimates would not converge in probability limit (plim) to their true values as the sample size is increased indefinitely.

To deal with this problem the three equations (17), (22) and (28) are estimated jointly using the three stage least squares (3SLS) procedure.[10] This involves regressing each of the endogenous variables in the system (DISC, COD, and SPREAD) on all exogenous variables at the first stage. At the second stage each regression is run with the endogenous variables appearing as regressors being replaced by their fitted values obtained at the first stage. In the context of this model, this involves replacing the DISC

[10]Equation (23) representing the tests of cost of equity is dropped because of the weak results of the OLS tests.

variable in equations (22) and (28) by its fitted value estimated at the first stage.[11] At the third stage an asymptotic covariance matrix is estimated using generalized least squares to correct for the possibility of cross-correlation between error terms.[12]

The 3SLS estimation approach was selected for a number of reasons. First, unlike some of the other simultaneous equations estimation methods (e.g., the indirect least squares estimation) unique parameter estimates can be obtained using 3SLS for an over-identified system of equations. Second, the 3SLS uses full information of the model to estimate its parameters rather than estimating one equation at a time as in the two stage least squares method. The major advantage of this is that the estimates have a smaller asymptotic variance-covariance matrix than single equation estimators. The 3SLS method thus yields more efficient parameter estimates as compared to single equation estimators like the two stage least squares.

[11]This can be interpreted as an instrumental variables approach where the fitted value of DISC is the instrument.

[12]See Greene [1993] for a discussion of the three-stage least squares estimation technique.

CHAPTER 6
RESEARCH RESULTS

Introduction

This chapter describes the results of the tests of the hypotheses developed in chapter 3. A preliminary test for management's incentives for disclosure is performed by looking at the correlations between the incentive variables and the total (mean adjusted) disclosure score reported in Table 4.5. The Table reveals that except for the insider trading proxy $TRADE^1$, all other incentive variables are significantly correlated with the total disclosure score in the hypothesized direction. Except for COD^1 (and $TRADE^1$), all other incentive variables are significantly correlated with the total disclosure score at less than 0.01 level while the correlation between the total disclosure score and COD^1 is significant at the 0.05 level.[1]

Regressions of Antecedent Factors

Tests Without the Insider Trading Variable

The possible impact of the antecedent factors on a firm's disclosure efforts are tested jointly using multivariate regression. Initially the regressions are run without the insider trading variable as the ORS tape used did not have complete trading data for 1991. Regressions of the disclosure scores on the four incentive variables: CEO ownership, institutional ownership, external financing need and proprietary costs, were run separately

[1]While not reported in Table 4.5, the correlation between the total disclosure score and $TRADE^2$ was also insignificant at conventional levels as was the correlation between $FINANCE^2$ and the total disclosure score.

for all three disclosure scores as well as for total score. Heteroscedasticity was a problem in the regressions as revealed by the Breusch-Pagan χ^2 which was significant at the 0.05 level for all regressions except for the investor relations regression. To deal with this White's heteroscedasticity-consistent variances and standard errors were estimated for all regressions. The results reported in Table 6.1 generally support all the hypotheses. All incentive variables are significant for all disclosure scores at the 0.01 level in the hypothesized direction, except for the proprietary cost variable for the investor relations score, which is significant at the 0.1 level. The control variable MVALUE included in the regressions is generally not significant. One reason for this could be that the incentive variables included are capturing part of the size effect.

Among the findings of Table 6.1, the results on CEO ownership (OWN) are especially interesting. A large body of literature in finance and accounting argue that the incentives of firm managers and shareholders can be aligned by providing firm managers with stock based compensation. While this could be valid when a firm's productive decisions are concerned, it is seen here that such stock ownership may not motivate firms to release all value relevant information to investors in a timely manner.

An examination of the correlations between the independent variables (given in Table 4.5) suggests that multicollinearity is not likely to be a problem in the regressions. As a test of multicollinearity, following Belsley, Kuh and Welsch (1980), the condition numbers were calculated for the four regressions. These numbers were found to be in the range of 8 to 9, which falls well below the critical level.

Tests With the Insider Trading Variable

To look at the possible association between insider trading and a firm's disclosure efforts, the regressions were rerun with the insider trading proxy TRADE[1] as an additional independent variable. The results, corrected for heteroscedasticity, based on

the reduced sample of observations for 1987-90 are given in Table 6.2. While the coefficient for $TRADE^1$ is observed to be negative in all regressions, the coefficient is significant only for annual report scores and total scores.

Looking at the sample characteristics of $TRADE^1$ given in Table 4.4, it is clear that there is a lot of variation in the proxy. Of particular concern is presence of some really high values in excess of 1. It is possible that some of these could be arising from errors in insider holding data or from special trading patterns. To deal with the possibility that the results are driven by some such outliers, the regressions are rerun after eliminating all observations with values of $TRADE^1$ exceeding 1. The results presented in Table 6.3 provide no support of the insider trading hypothesis as the coefficients generally turn out to be positive. As a second robustness check the regressions are rerun using the second proxy for insider trading $TRADE^2$. The results of regressions using this proxy, given in Table 6.4, are generally similar to that in Table 6.2 to the extent that the coefficient of the insider trading variable generally come out to be positive.

The results of the tests of the insider trading hypothesis are surprising. Even though it is intuitively expected that firms with higher asymmetry of information have a larger incidence of insider trading such a behavior is not observed for this sample. There could be two possible reasons for the weak results on the insider trading. One possibility is that the firm managers are aware of the fact that their trades are observed by investors, financial analysts, and regulatory authorities and thus are careful not to attract attention through their trading behavior. A second possibility is that the insider trading proxy used here is a noisy measure of actual insider trading activity. Because of the lack of significance of the insider trading variables in the univariate (as given by correlation coefficients) and multivariate tests, this variable is excluded from the remaining regressions.

Regressions of the Consequences

Disclosures and the Cost of Debt

The results of regression (22) examining the cost of capital hypothesis using the borrowing cost measure COD^1 is given in Table 6.5. Heteroscedasticity was found to be present in these regressions also (with the Breusch-Pagan χ^2 ranging from 47.75 to 52.43). Hence, as before, White's correction for heteroscedasticity was performed. The results support the cost of capital (debt) hypothesis for quarterly and other information and total disclosure scores. The investor relations score is significant at the 0.1 level while the annual report score is not significant (though the coefficient is negative as hypothesized). The four control variables used, ROA^1, LEVER, LIQUID and STDRETN are significant at the 0.01 level in the hypothesized direction for all disclosure scores.

The weaker results of the hypothesis in the context of annual report scores could be explained in terms of the timing of such disclosures. Given that the annual report of a firm for year t would be released approximately 3-4 months into fiscal year t+1, it is likely that much of the borrowing decisions for year t+1 has been made by the time the report goes public. It is thus possible that the lending parties have made lending decisions already based on prior information. The information released in annual reports may not correlate very strongly with the firm's average borrowing costs for period t+1.

Disclosures and Cost of Equity

The results of the cost of equity hypothesis are depicted in Table 6.6. The results, corrected for heteroscedasticity, provide no support of the cost of equity hypothesis. The coefficients for disclosure scores are generally positive and significant, going against the cost of equity hypothesis. Thus firms with higher returns seem to disclose more information. The two control variables LMVALUE and LBEMVAL are also not

significant in the regressions. The R^2 of 1 percent or less suggests that the model is a poor fit.

The weak results of the cost of equity regressions as compared to those reported by Fama and French (1992) could be partly explained by the differences in sample size and methodology. First, Fama and French used all firms in the NYSE, AMEX and NASDAQ returns files with the requisite data. The sample here consists of approximately 250 observations per year (as compared to the average of 2267 observations in the Fama and French's monthly regressions). Second, Fama and French ran the regressions separately for each month over the period 1963-90 and took averages of the regression coefficients. The sample used in this study did not permit this. As Kothari, Shanken and Sloan (1995) argued, the Fama and French tests had low power inspite of their larger samples (as compared to that of this study). In fact upon replicating the results of Fama and French using a different dataset, Kothari, Shanken and Sloan found only a weak relationship between average stock returns and LBEMVAL for the 1947-87 period.

In view of the inconclusive results of the cost of equity hypothesis, this is not considered later in the simultaneous equation setup.

Disclosures and the Bid-Ask Spread

The results of the bid-ask spread hypothesis is depicted in Table 6.7. The results, corrected for heteroscedasticity, provide strong support of the hypothesis and are significant for all disclosure scores. The two control variables VOL and STDRETN are also significant at less than 0.01 level in the predicted direction for all disclosure scores[2].

Tests of multicollinearity were performed for each of the three regressions (22), (23) and (28). Correlations between the independent variables were not critically high for these regressions. The condition numbers for the cost of debt hypothesis were found to range

[2]The Breusch-Pagan χ^2 ranged from 467 to 500.11 for the four regressions.

from 20.40 to 26.95, while those for the bid-ask spread hypothesis were found to range from 15.3 to 21.46. While these numbers do not indicate the existence of severe multicollinearity problems they do suggest the possibility of multicollinearity exists. Informal tests of multicollinearity were performed by examining if the results were sensitive to "slight" changes in the sample. The coefficients however, were all significant in the hypothesized direction and were not affected by the manipulations. Thus, it may be reasonable to argue that the qualitative results of the regressions are not affected by multicollinearity problems.

Simultaneous Tests of Incentives Using 3SLS Regressions

Although the cost of debt, cost of equity, and bid-ask spread hypotheses are tested separately from the antecedent incentives, it is clear that firms will jointly consider the impact of their disclosure decisions on all of these components of cost of capital. Moreover, given that the antecedent factors affect disclosures and this in turn affects the firm's cost of capital, all incentive variables are interrelated. To capture these interdependencies between the antecedent and consequent incentives, the three equations (17), (22) and (28) are reestimated jointly using three-stage least squares regression.[3] The results are given in Table 6.8. The results provide strong support of most of the hypotheses presented. Apart from the proprietary cost variable $PROP^1$, all other variables are significant at less than 0.01 level for all disclosure scores. The results on proprietary costs are inconclusive and provide no support of the hypothesized negative relationship between disclosures and proprietary costs.

In comparing the results of the separate tests of antecedent and consequent incentives (given in Tables 6.1, 6.5 and 6.7) with those of the simultaneous tests (in Table 6.8) a number of differences are apparent. First, the control variable MVALUE is statistically

[3]The cost of equity equation is dropped out because of the lack of significance of all variables in this regression.

significant at the 0.01 level for all disclosure scores for the 3SLS regressions. In table 6.1, this variable is significant only for total disclosure scores. Second, the results of the cost of debt and bid-ask spread hypotheses are stronger for the 3SLS regressions as compared to the separate tests. Third, the proprietary cost variable is significant in Table 6.1; not so for the 3SLS regressions in Table 6.8.

Sensitivity Analysis

Sensitivity to Different Proxies of the Disclosure Variables

As discussed earlier, the disclosure scores used in the regressions were all adjusted so that the mean of each industry coincides with the population mean. This was done to eliminate possible biases arising from differences in scoring process and analyst characteristics across industries. One of the problems of such an adjustment, however, is that it eliminates possible differences in the disclosure practices across industries. In reality it is possible that the average disclosure scores of one industry are higher than another because the disclosure practices of one industry are inherently different from that of another. Thus, firms in one industry may follow other firms in the same industry in making disclosure choices. Alternatively, differences in industry characteristics may make the same piece of information more relevant to one industry as compared to another. To check for these possibilities, the 3SLS regressions are rerun with the raw unadjusted disclosure scores. The results summarized in Table 6.9 are similar to that in Table 6.8 to the extent that all incentive variables other than the proprietary cost variable are significant at conventional levels. Comparing the R^2's it seems that the model is a slightly better fit when raw disclosure scores are used.

Because the sample used consists of a cross-section of firms pooled over the period 1987-91 (1987-90 for the 3SLS regressions), observations of some firms are repeated in the sample. This can lead to the possibility that the observations are not independent of

each other. To deal with this problem the 3SLS regressions were rerun with only one observation per firm. The results based on this reduced sample, given in Table 6.10, were qualitatively similar to that in Table 6.8. As with the full sample, the results support all hypotheses (other than the proprietary cost hypothesis) at 0.05 level for all disclosure scores. The similarity of the results between Tables 6.8 and 6.10 enhances the robustness of this study.

Sensitivity Relating to the Incentive Proxies

Proprietary costs. As discussed above, the proprietary cost measure $PROP^1$ was taken as a 0-1 variable with $PROP^1=1$ for firms in the top ten percentile in terms of return on assets, zero otherwise. The ten-percent cutoff point was selected somewhat arbitrarily. Clearly, proprietary costs become significant only after returns become sufficiently large. Prior research, however, does not shed light on what the critical level of returns should be. A number of alternative cutoff points (such as 5 percent and 15 percent) were examined. In general the results tend to become weaker as the critical (or cutoff) rate of return value is decreased. A ten percent cutoff level may be appropriate for representing proprietary costs in the form of monopoly power which is likely to be present in markets dominated by a few firms.

To test the robustness of the findings on the proprietary cost hypothesis, three other proxies: $PROP^2$, $PROP^3$ and $PROP^4$ were also considered. $PROP^2$ is different from $PROP^1$ to the extent that the former includes interest expense, the return arising to debtholders. The results of the regressions using this gross rate of return measure is given in Table 6.11. The results are quantitatively similar to that using $PROP^1$, i.e., $PROP^2$ is not significant either. This is not surprising as the two measures have a correlation of about 0.92.

Proprietary costs could also be proxied by firm size. When firm size becomes very large, proprietary costs can become significant. Large firms, however, are also likely to face more pressure from investors and financial analysts to release information. Hence it is possible that disclosures are increasing in firm size initially, but when size becomes sufficiently large (and proprietary costs become high) disclosures start to decrease. This is tested by adding a square of size measure, $PROP^3 = (MVALUE)^2$. A negative coefficient for $PROP^3$ would support the hypothesis. The results of the regressions using $PROP^3$ are given in Table 6.12. The results provide strong support of the hypothesis as the coefficient for $PROP^3$ is found to be negative and significant at less than 0.01 level for all disclosure scores.

Lastly, a measure of proprietary costs based on the market share of the firm is also examined. According to this measure, proprietary cost $PROP^4$ is measured in terms of the ratio of the total sales of the firm divided by the total sales of the largest eight firms in the industry defined by two-digit SIC codes. The argument here is that firms with large market share are likely to be operating in an oligopolistic environment so that proprietary costs of disclosures could be high for these firms. The results of the regressions using $PROP^4$ are given in Table 6.13. The results provide no support of the proprietary cost hypothesis as the coefficient of $PROP^4$ is generally insignificant. One possible explanation of the weak results is that the concept of market share may not be meaningful for a large fraction of the firms in the sample that are multi-product firms. For multi-product or diversified firms, the market share measure reduces to a size measure and thus may not correspond to proprietary costs very well.

Overall the results provide a weak support of the proprietary cost hypothesis. The hypothesis is supported for the rate of return measure $PROP^1$ (and also $PROP^2$ which was not reported here) for the OLS tests of antecedent factors and for the square of the size measure $PROP^3$ for simultaneous three-stage least squares regressions. The proxies used thus may not be properly capturing the proprietary costs.

Need for Financing. The relationship between a firm's financing needs and disclosures were examined in terms of $FINANCE^1$ which measured a firm's expected financing needs for the future period. An alternative is to use the actual cash inflow from financing activities of the firm. This is given by $FINANCE^2$. To test the hypothesized association between a firm's financing needs and disclosures in the context of this alternative proxy, the three-stage least squares regressions are rerun with $FINANCE^2$ as the appropriate proxy. The results are summarized in Table 6.14. The results do not provide support of the hypothesis, though the coefficient is generally positive. A possible explanation for the lack of significance is that the net cash inflow figure would be low for firms which make large payments of principal and interest from past loans. Hence $FINANCE^2$ may not be the good measure of a firm's financing need.[4]

Cost of Debt. The cost of debt measure COD^1 used so far was based on total borrowings of the firm. To test the robustness of the findings relating to the cost of debt hypothesis, the regressions are rerun with COD^2 as the appropriate proxy. The WARGA fixed income database did not have bond data for 1992 so that the disclosure scores of 1991 could not be matched by the corresponding yield figures. Moreover, many of the firms in the sample did not have bond data so that the sample had to be reduced to about 400 observations. The results based on this smaller sample are summarized in Table 6.15. The results provide weak support of the cost of debt hypothesis. COD^2 is significant at 0.1 level for annual report scores, investor relations score and the total score. The quarterly report score is not significant. The weaker result of the cost of debt hypothesis in the context of COD^2 could be partly due to a loss of power resulting from the substantial reduction in the sample size.

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[4]COMPUSTAT does not provide separate data on cash inflows and outflows from financing activities in any given period.

Additional Tests

To test further for the robustness of the results, a number of additional tests were performed.

Market Uncertainty and Impact of Disclosures

It may be argued that the impact of disclosures depends, in part, on the degree of asymmetry of information in the market. Thus, in a market where there is already a lot of information about the firm, disclosures would have limited impact as compared to another where there is very little information about the firm outside of corporate disclosures. There could be a number of proxies for the degree of asymmetry of information in the market. One option is to use the standard deviation of stock returns (STDRETN). Large fluctuations in stock returns would suggest market uncertainty about the firm's future prospects. A second option is to use dispersion in analysts' forecasts (DISP). Higher dispersion may indicate greater uncertainty in the market.

Tests could now be performed by partitioning the full sample into high and low groups based on mean (or median) values of STDRETN or DISP. It is expected that the impact of disclosures on cost of debt or bid-ask spread would be stronger for the high STDRETN (or DISP) group as compared to the low STDRETN (or DISP) group. Given that disclosures are hypothesized to be negatively associated with the cost of debt and bid-ask spread, this implies that the coefficient of the disclosure variable (b_1 in regression (22) and c_1 in regression (28)) should be larger for the low group as compared to the high group.

To allow for differences in the coefficients of the disclosure scores in the two groups, dummy variables are used. Consider, for example, the bid-ask spread equation (28). The above discussion suggests that

$$SPREAD_{t+1} = c_0 + c_1 DISC_t + c_2 VOL_t + STDRETN_t + \varepsilon'''' \quad \text{for the low group,}$$

$$SPREAD_{t+1} = c_0 + c'_1 DISC_t + c_2 VOL_t + STDRETN_t + \varepsilon'''' \quad \text{for the high group,}$$

with $(c'_1 - c_1) < 0$. To test for this difference, a dummy variable D is created such that

D = 0 for the low STDRETN (or DISP) group

= the disclosure scores, DISC, for the high STDRETN or (DISP) group.

. The coefficient of this dummy variable represents the slope difference $(c'_1 - c_1)$. The same technique is used for the cost of debt regressions. To allow for the possibility that the intercept term varies systematically across the two groups, a 0-1 dummy for the constant term was tried out for each regression. This dummy was found to be significant only in one case and is thus not used in the other regressions.

To split up the sample into high and low STDRETN groups, the mean value of STDRETN is used. The results of the tests for the cost of debt hypothesis using the dummy variables approach are given in Table 6.16. The table reveals that the coefficients for D are generally negative as hypothesized. The coefficients are significant for the annual report scores and quarterly scores at the 0.05 level and for the total score at the 0.1 level. These results are consistent with the argument that disclosures have a stronger impact on a firm's cost of debt in an environment where there is more market uncertainty.[5]

Results of the tests of the bid-ask spread hypothesis for the high and low STDRETN group are provided in Table 6.17. The coefficients of D in this Table are also negative but not significant.

The tests are now replicated by partitioning the sample based on high and low values for DISP. Data for the calculation of the dispersion of financial analysts' EPS forecasts were obtained from the Institutional Brokers Estimate System (I/B/E/S) History Tape developed by Lynch, Jones & Ryan brokerage house. This tape provides summary

[5]A dummy for the constant term was used in this regression and was found to be positive for all disclosure scores except the investor relations score. The positive coefficient indicates that the average cost of debt for the high STDRETN group is higher than that for the low STDRETN group, as expected.

information about financial analysts' earnings per share forecasts each month from early 1975 to early 1991. The dataset provides information such as the number of forecasts, mean and median forecast, and standard deviation of the forecasts.

For the purpose of this study, only forecasts made in the last three months before the fiscal year-end, are considered. Following Elliot and Philbrick (1990), Ajinkya, Atiase and Gift (1991), and others, DISP is calculated for each month as the ratio of the standard deviation of the forecasts divided by the mean forecast. The average of this over the three months prior to the fiscal year-end is taken as the DISP measure. The high DISP sample then consists of all firms with values of DISP above the median.[6]

Results of the tests of slope difference based on DISP for the cost of debt hypothesis and the bid-ask spread hypothesis are given in Tables 6.18 and 6.19 respectively. Looking at the results relating to the cost of debt hypothesis in Table 6.18 it is clear that the coefficients of the dummy D are negative and significant as hypothesized. The bid-ask spread results reported in Table 6.19, on the other hand, appear to be opposite. The coefficients of the dummy D are positive and significant. Thus, the relationship between disclosures and the bid-ask spread appear to be stronger when there is low dispersion in analysts' forecasts.

Good News Versus Bad News disclosures and Cost of Capital

As it was mentioned in chapter 3, the specific impact of disclosures is likely to depend on the nature of disclosures. Thus, firms releasing negative information could end up facing a higher cost of borrowing as compared to those releasing positive information. The nature of the disclosure measure used in this study does not allow for differentiating between good news and bad news disclosures. As an alternative, mean analyst forecasts

[6]The sample was somewhat skewed so that the cutoff was based on median rather than mean DISP.

of earnings per share obtained from I/B/E/S tapes, were compared with actual earnings per share to identify whether the firms had good news or bad news. A firm was classified as a "good news" firm if the mean analyst forecast for the last month before fiscal year-end was less than the actual earnings per share. On the other hand, if the forecasts were greater than the actual, the firm was classified as a "bad news firm". The relationship between disclosures and cost of debt was then compared across the two groups. As before, the dummy variables technique was used to perform this comparison. A dummy variable D was created such that

D = 0 for the bad news group

= the disclosure scores DISC, for the good news group.

If disclosures have a stronger impact on cost of debt for the good news firms, the coefficient for D should be negative. The results of the tests are summarized in Table 6.20. The results provide strong support of this hypothesis. The coefficient of the dummy variable D is found to be negative and significant for all disclosure scores.

Comparison of Results Across Types of Disclosures

Results of the tests do not suggest any qualitative difference in results across the type of disclosure category. The results of the annual report scores seem to be the most powerful as represented by the slightly higher R^2's. The R^2's of the other two disclosure scores are generally smaller. The scores on investor relations seem to be the most noisy as represented by the R^2's and the higher variances of this scores. The broad consistency of the results across the type of disclosures indicates that firms tend to have an overall disclosure strategy and this strategy governs most of its disclosures.

Table 6.1
Estimation results for regressions of antecedent factors (without insider trading)*
$DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^1_t + a_4OWN_t + a_5INST_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	68.878 61.973 (0.0001)	69.272 48.154 (0.0001)	67.834 42.595 (0.0001)	68.890 60.869 (0.0001)
MVALUE (a_1)	+	0.069 1.889 (0.03)	0.007 0.145 (0.45)	-0.017 -0.229 (0.41)	0.021 0.513 (0.31)
FINANCE^1 (a_2)	+	5.619 3.056 (0.0012)	6.497 2.764 (0.003)	7.045 2.749 (0.003)	6.582 3.590 (0.0002)
PROP^1 (a_3)	-	-2.402 -2.569 (0.0051)	-4.129 -3.261 (0.0006)	-2.28 -1.502 (0.07)	-2.875 -2.974 (0.0015)
OWN (a_4)	-	-0.179 -3.483 (0.0003)	-0.211 -3.305 (0.0005)	-0.13 -2.002 (0.023)	-0.169 -3.509 (0.0003)
INST (a_5)	+	0.056 2.995 (0.0014)	0.06 2.482 (0.007)	0.078 2.901 (0.0019)	0.062 3.275 (0.0006)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		19.439 0.05 1049	11.429 0.04 1049	4.648 0.03 1049	19.034 0.06 1049

DISC refers to the disclosure scores. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). FINANCE^1 is given by (future period capital expenditures - current period working capital)/(current period assets). PROP^1 = 1 if ROA^1 $\geq$ 0.13, otherwise PROP^1 = 0 (ROA^1 is the ratio of net income to total assets). OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.2

Estimation results for regressions of antecedent factors (with $TRADE^1$)*

$DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE_t^1 + a_3PROP_t^1 + a_4OWN_t + a_5INST_t + a_6TRADE_t^1$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	67.761 50.065 (0.0001)	67.987 37.903 (0.0001)	65.174 34.785 (0.0001)	67.423 50.113 (0.0001)
MVALUE (a_1)	+	0.096 1.715 (0.0433)	0.021 0.285 (0.39)	-0.021 -0.189 (0.43)	0.040 0.626 (0.27)
$FINANCE^1$ (a_2)	+	4.221 2.059 (0.02)	5.592 2.121 (0.017)	4.979 1.73 (0.042)	5.149 2.565 (0.0051)
$PROP^1$ (a_3)	-	-2.497 -2.334 (0.01)	-4.648 -3.199 (0.0007)	-1.720 -1.015 (0.16)	-2.912 -2.698 (0.0035)
OWN (a_4)	-	-0.154 -2.468 (0.007)	-0.165 -2.353 (0.0094)	-0.067 -0.974 (0.17)	-0.123 -2.428 (0.008)
INST (a_5)	+	0.067 3.029 (0.0013)	0.077 2.636 (0.0042)	0.117 3.722 (0.0001)	0.082 3.687 (0.0001)
$TRADE^1$ (a_6)	-	-0.093 -2.059 (0.02)	-0.046 -1.504 (0.07)	-0.038 -1.419 (0.08)	-0.07 -3.099 (0.001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		19.230 0.05 778	14.305 0.05 778	5.767 0.03 778	15.759 0.06 778

DISC refers to the disclosure scores. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). $PROP^1 = 1$ if $ROA^1 \geq 0.13$, otherwise $PROP^1 = 0$ (ROA^1 is the ratio of net income to total assets). OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $TRADE^1$ represents the ratio of total open market purchases and sales of insiders to total insider holdings.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.3
Estimation results for regressions of antecedent factors
(extreme values of $TRADE^1$ excluded)*

$$DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE_t^1 + a_3PROP_t^1 + a_4OWN_t + a_5INST_t + a_6TRADE_t^1$$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	68.018 47.386 (0.0001)	66.998 36.43 (0.0001)	64.667 32.368 (0.0001)	67.175 47.255 (0.0001)
MVALUE (a_1)	+	0.068 1.282 (0.1)	-0.006 -0.084 (0.47)	-0.03 -0.263 (0.4)	0.017 0.273 (0.4)
$FINANCE^1$ (a_2)	+	4.999 2.387 (0.031)	5.966 2.20 (0.014)	5.382 1.793 (0.037)	5.778 2.794 (0.0026)
$PROP^1$ (a_3)	-	-2.159 -2.114 (0.0173)	-4.204 -2.842 (0.0023)	-2.146 -1.259 (0.11)	-2.76 -2.536 (0.006)
OWN (a_4)	-	-0.17 -2.636 (0.0042)	-0.162 -2.232 (0.013)	-0.075 -1.057 (0.15)	-0.132 -2.486 (0.0065)
INST (a_5)	+	0.061 2.619 (0.0045)	0.091 3.042 (0.0012)	0.124 3.742 (0.0001)	0.083 3.599 (0.0002)
$TRADE^1$ (a_6)	-	5.685 1.868 (0.031)	4.234 1.191 (0.12)	3.453 0.714 (0.24)	4.759 1.754 (0.04)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		26.889 0.06 748	15.372 0.05 748	4.852 0.04 748	21.328 0.06 748

DISC refers to the disclosure scores. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). $PROP^1 = 1$ if $ROA^1 \geq 0.13$, otherwise $PROP^1 = 0$ (ROA^1 is the ratio of net income to total assets). OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $TRADE^1$ represents the ratio of total open market purchases and sales of insiders to total insider holdings.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.4
Estimation results for regressions of antecedent factors (with $TRADE^2$)*
$DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE_t^1 + a_3PROP_t^1 + a_4OWN_t + a_5INST_t + a_6TRADE_t^2$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	67.981 52.991 (0.0001)	67.852 40.092 (0.0001)	66.075 35.691 (0.0001)	67.610 53.097 (0.0001)
MVALUE (a_1)	+	0.098 1.757 (0.04)	0.0019 0.027 (0.49)	-0.032 -0.29 (0.39)	0.032 0.521 (0.31)
$FINANCE^1$ (a_2)	+	5.011 2.522 (0.006)	6.371 2.477 (0.007)	5.651 2.018 (0.022)	5.871 3.013 (0.0013)
$PROP^1$ (a_3)	-	-2.306 -2.262 (0.012)	-3.868 -2.807 (0.0025)	-2.018 -1.241 (0.11)	-2.645 -2.603 (0.005)
OWN (a_4)	-	-0.145 -2.405 (0.0081)	-0.164 -2.488 (0.0065)	-0.07 -1.057 (0.15)	-0.118 -2.440 (0.0074)
INST (a_5)	+	0.060 2.866 (0.0021)	0.076 2.886 (0.002)	0.105 3.422 (0.0004)	0.078 3.711 (0.0002)
$TRADE^2$ (a_6)	-	8.020 0.695 (0.25)	15.185 1.31 (0.1)	16.485 1.283 (0.1)	12.419 1.504 (0.07)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		18.839 0.05 829	11.764 0.04 829	6.018 0.03 829	14.562 0.06 829

DISC refers to the disclosure scores. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). $PROP^1 = 1$ if ROA^1 0.13, otherwise $PROP^1 = 0$ (ROA^1 is the ratio of net income to total assets). OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $TRADE^2$ represents the ratio of total open market purchases and sales of insiders to shares traded by insiders.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two-tailed test for intercept terms).

Table 6.5
Estimation results for regressions of cost of debt hypothesis (with COD^1)*
$COD^1_{t+1} = b_0 + b_1DISC_t + b_2ROA^1_t + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (b_0)	?	-0.036 -5.459 (0.0001)	-0.031 -5.615 (0.0001)	-0.037 -6.799 (0.0001)	-0.031 -4.598 (0.0001)
DISC (b_1)	-	-0.00007 -1.065 (0.15)	-0.00014 -2.866 (0.0021)	-0.000067 -1.356 (0.07)	-0.00015 -2.116 (0.018)
ROA^1 (b_2)	-	-0.065 -5.471 (0.0001)	-0.065 -5.539 (0.0001)	-0.065 -5.508 (0.0001)	-0.065 -5.519 (0.0001)
LEVER (b_3)	+	0.04 8.682 (0.0001)	0.041 8.975 (0.0001)	0.041 8.816 (0.0001)	0.041 8.850 (0.0001)
LIQUID (b_4)	-	-0.012 -3.152 (0.0009)	-0.012 -3.221 (0.0007)	-0.011 -3.037 (0.0012)	-0.012 -3.238 (0.0006)
STDRETN (b_5)	+	0.427 3.851 (0.0006)	0.423 3.823 (0.0001)	0.426 3.856 (0.0001)	0.419 3.791 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		52.428 0.22 1133	47.750 0.23 1133	51.999 0.22 1133	49.973 0.23 1133

COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. DISC refers to the disclosure scores. ROA^1 is the ratio of net income to total assets. LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed tests for the intercept terms).

Table 6.6
Estimation results for regressions of cost of equity hypothesis*
$COE_{t+1} = d_0 + d_1 LMVALUE_t + d_2 LBEMVAL_t + d_3 \beta_{t+1} + d_4 DISC_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (d_0)	?	-0.031 -1.313 (0.189)	-0.008 -0.418 (0.676)	0.0004 0.025 (0.98)	-0.027 -1.131 (0.258)
LMVALUE (d_1)	-	0.001 0.52 (0.31)	0.001 0.709 (0.24)	0.001 0.721 (0.24)	0.001 0.598 (0.28)
LBEMVAL (d_2)	+	-0.004 -0.932 (0.18)	-0.004 -0.924 (0.18)	-0.003 -0.796 (0.22)	-0.004 -0.888 (0.19)
β (d_3)	-	0.004 0.818 (0.21)	0.004 0.761 (0.224)	0.004 0.681 (0.25)	0.004 0.78 (0.22)
DISC (d_4)	-	0.0007 2.829 (0.0024)	0.0004 1.92 (0.028)	0.0003 1.41 (0.075)	0.0007 2.492 (0.0064)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		148.82 0.01 1150	151.751 0.007 1150	152.266 0.005 1150	152.092 0.009 1150

COE is the cumulated monthly stock return of the firm. LMVALUE is the log of the market value of the firm's common equity; LBEMVAL is the ratio of the book value of the firm's common equity to its market value. β represents the market beta of the firm's stock calculated from daily stock returns over the firm's fiscal year subsequent to the disclosure year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two-tailed test for the intercept terms).

Table 6.7
Estimation results for regressions of the bid-ask spread hypothesis*
$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (c_0)	?	0.007 3.552 (0.0002)	0.007 4.509 (0.0001)	0.003 2.052 (0.021)	0.008 3.944 (0.0001)
DISC (c_1)	-	-0.000087 -3.653 (0.00013)	-0.000083 -4.430 (0.0001)	-0.000032 -1.783 (0.038)	-0.000097 -3.769 (0.0001)
VOL(c_2)	-	-0.007 -6.03 (0.0001)	-0.007 -6.312 (0.0001)	-0.007 -6.054 (0.0001)	-0.007 -6.088 (0.0001)
STDRETN (c_3)	+	0.482 8.962 (0.0001)	0.482 9.258 (0.0001)	0.486 9.145 (0.0001)	0.481 9.122 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		483.188 0.23 927	498.955 0.24 927	467.080 0.22 927	490.922 0.23 927

SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). DISC refers to the disclosure scores. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two-tailed tests for the intercept terms).

Table 6.8
Results of the 3SLS regressions (with mean adjusted disclosure scores)*
Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^1_t + a_4OWN_t + a_5INST_t$
$COD^1_{t+1} = b_0 + b_1DISC_t + b_2ROA^1_t + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$
$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	66.928 79.775 (0.0001)	65.239 57.859 (0.0001)	66.249 57.293 (0.0001)	66.904 80.122 (0.0001)
MVALUE (a_1)	+	0.151 3.709 (0.0001)	0.182 3.243 (0.0006)	0.174 3.836 (0.0001)	0.141 3.556 (0.0002)
FINANCE^1 (a_2)	+	6.007 4.082 (0.0001)	6.672 3.510 (0.0003)	5.993 3.515 (0.0003)	5.914 4.093 (0.0001)
PROP^1 (a_3)	-	-0.215 -0.268 (0.40)	-1.10 -0.993 (0.17)	0.12 0.137 (0.45)	-0.589 -0.747 (0.23)
OWN (a_4)	-	-0.147 -3.412 (0.0004)	-0.225 -3.659 (0.0002)	-0.146 -3.164 (0.0008)	-0.156 -3.652 (0.0002)
INST (a_5)	+	0.077 5.529 (0.0001)	0.115 6.014 (0.0001)	0.088 4.325 (0.0001)	0.083 5.813 (0.0001)
INTERCEPT (b_0)	?	0.121 4.81 (0.0001)	0.04 1.783 (0.075)	0.088 2.587 (0.0099)	0.103 3.722 (0.0002)
DISC (b_1)	-	-0.002 -7.095 (0.0001)	-0.001 -4.231 (0.0001)	-0.002 -4.046 (0.0001)	-0.002 -5.728 (0.0001)
ROA^1 (b_2)	-	-0.033 -3.002 (0.0014)	-0.04 -3.636 (0.0002)	-0.032 -2.644 (0.0042)	-0.038 -3.449 (0.0003)
LEVER (b_3)	+	0.052 12.213 (0.0001)	0.053 12.174 (0.0001)	0.053 10.118 (0.0001)	0.054 12.488 (0.0001)
LIQUID (b_4)	-	-0.021 -5.173 (0.0001)	-0.017 -4.205 (0.0001)	-0.019 -4.522 (0.0001)	-0.02 -4.86 (0.0001)

Table 6.8--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_4)	+	0.25 2.483 (0.007)	0.294 2.816 (0.0025)	0.275 2.33 (0.011)	0.25 2.348 (0.01)
INTERCEPT (c_0)	?	0.069 7.567 (0.0001)	0.054 5.857 (0.0001)	0.073 6.859 (0.0001)	0.07 6.585 (0.0001)
DISC (c_1)	-	-0.0009 -7.463 (0.0001)	-0.0007 -5.761 (0.0001)	-0.001 -6.781 (0.0001)	-0.001 -6.531 (0.0001)
VOL (c_2)	-	-0.005 -4.189 (0.0001)	-0.005 -4.172 (0.0001)	-0.004 -3.953 (0.0001)	-0.005 -4.215 (0.0001)
STDRETN (c_3)	+	0.352 9.208 (0.0001)	0.353 9.018 (0.0001)	0.331 8.353 (0.0001)	0.347 8.693 (0.0001)
System R^2 No. of obs.		0.21 743	0.18 743	0.14 743	0.2 743

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). ROA^1 is the ratio of net income to total assets. $PROP^1 = 1$ if $ROA^1 \geq 0.13$, otherwise $PROP^1 = 0$. COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.9
Results of the 3SLS regressions (with unadjusted disclosure scores)*
Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^1_t + a_4OWN_t + a_5INST_t$
$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$
$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2MVALUE_t + c_3VOL_t + c_4STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	62.557 46.764 (0.0001)	62.250 45.129 (0.0001)	64.934 38.569 (0.0001)	63.381 51.086 (0.0001)
MVALUE (a_1)	+	0.314 4.693 (0.0001)	0.296 4.768 (0.0001)	0.326 4.786 (0.0001)	0.298 5.148 (0.0001)
FINANCE^1 (a_2)	+	6.339 3.134 (0.0009)	6.587 3.315 (0.0005)	6.647 3.177 (0.0008)	5.575 3.208 (0.007)
PROP^1 (a_3)	-	-0.382 -0.331 (0.38)	-0.051 -0.049 (0.49)	0.264 -0.225 (0.42)	-0.095 -0.098 (0.47)
OWN (a_4)	-	-0.197 -3.386 (0.0004)	-0.194 -3.360 (0.0004)	-0.209 -3.417 (0.0004)	-0.183 -3.562 (0.0002)
INST (a_5)	+	0.126 5.768 (0.0001)	0.122 5.284 (0.0001)	0.137 4.995 (0.0001)	0.121 5.934 (0.0001)
INTERCEPT (b_0)	?	0.051 3.967 (0.0001)	0.045 2.986 (0.0029)	0.031 1.978 (0.0483)	0.053 3.74 (0.0002)
DISC (b_1)	-	-0.001 -7.837 (0.0001)	-0.001 -6.344 (0.0001)	-0.001 -4.937 (0.0001)	-0.001 -7.234 (0.0001)
ROA^1 (b_2)	-	-0.034 -3.107 (0.001)	-0.032 -2.897 (0.002)	-0.031 -2.726 (0.0033)	-0.031 -2.837 (0.0024)
LEVER (b_3)	+	0.056 12.166 (0.0001)	0.055 11.567 (0.0001)	0.052 10.656 (0.0001)	0.055 11.777 (0.0001)
LIQUID (b_4)	-	-0.014 -3.374 (0.0004)	-0.017 -4.387 (0.0001)	-0.016 -3.747 (0.0001)	-0.014 -3.614 (0.0002)

Table 6.9--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_4)	+	0.227 2.219 (0.0134)	0.252 2.464 (0.007)	0.285 2.673 (0.0039)	0.234 2.253 (0.0123)
INTERCEPT (c_0)	?	0.053 10.335 (0.0001)	0.06 9.16 (0.0001)	0.059 9.571 (0.0001)	0.062 10.59 (0.0001)
DISC (c_1)	-	-0.0007 -10.111 (0.0001)	-0.0008 -8.980 (0.0001)	-0.0008 -9.414 (0.0001)	-0.0008 -10.425 (0.0001)
VOL (c_2)	-	-0.002 -2.022 (0.022)	-0.002 -1.739 (0.042)	-0.002 -1.753 (0.041)	-0.002 -1.543 (0.061)
STDRETN (c_3)	+	0.322 8.597 (0.0001)	0.305 7.992 (0.0001)	0.295 7.562 (0.0001)	0.3 7.882 (0.0001)
System R^2 No. of obs.		0.24 743	0.21 743	0.22 743	0.25 743

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). ROA^1 is the ratio of net income to total assets. $PROP^1 = 1$ if $ROA^1 \geq 0.13$, otherwise $PROP^1 = 0$. COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.10

Results of the 3SLS regressions (with one observation per firm)*

Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^1_t + a_4OWN_t + a_5INST_t$

$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	67.372 47.043 (0.0001)	68.307 36.074 (0.0001)	67.834 31.338 (0.0001)	68.669 49.819 (0.0001)
MVALUE (a_1)	+	0.147 2.223 (0.014)	0.141 1.546 (0.062)	0.12 0.177 (0.13)	0.12 1.892 (0.03)
FINANCE^1 (a_2)	+	9.06 3.307 (0.0006)	11.922 3.316 (0.0005)	7.701 2.052 (0.021)	8.036 3.062 (0.0012)
PROP^1 (a_3)	-	-0.382 -0.279 (0.4)	-1.118 -0.604 (0.274)	-0.851 -0.435 (0.333)	-0.697 -0.527 (0.3)
OWN (a_4)	-	-0.24 -3.473 (0.0003)	-0.349 -3.557 (0.0002)	-0.241 -2.758 (0.0031)	-0.217 -3.289 (0.0006)
INST (a_5)	+	0.071 2.342 (0.0024)	0.089 2.682 (0.004)	0.089 2.29 (0.0114)	0.066 2.681 (0.004)
INTERCEPT (b_0)	?	0.092 2.499 (0.0131)	0.03 0.827 (0.4089)	0.024 0.384 (0.7014)	0.097 2.057 (0.0407)
DISC (b_1)	-	-0.002 -4.21 (0.0001)	-0.001 -2.474 (0.007)	-0.001 -1.219 (0.112)	-0.002 -3.307 (0.0006)
ROA^1 (b_2)	-	-0.007 -0.461 (0.33)	-0.01 -0.648 (0.26)	-0.006 -0.249 (0.41)	-0.011 -0.689 (0.25)
LEVER (b_3)	+	0.051 8.436 (0.0001)	0.05 7.665 (0.0001)	0.047 3.899 (0.0001)	0.052 7.727 (0.0001)
LIQUID (b_4)	-	-0.02 -3.008 (0.0015)	-0.017 -2.264 (0.0122)	-0.015 -1.756 (0.041)	-0.019 -2.75 (0.0032)

Table 6.10--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_s)	+	0.425 2.426 (0.008)	0.508 3.86 (0.0023)	0.554 2.464 (0.0072)	0.448 2.362 (0.01)
INTERCEPT (c_0)	?	0.046 3.213 (0.0015)	0.036 3.127 (0.002)	0.046 3.803 (0.0002)	0.055 3.355 (0.0009)
DISC (c_1)	-	-0.0006 -3.247 (0.0007)	-0.0005 -3.113 (0.0011)	-0.0006 -3.824 (0.0001)	-0.0008 -3.38 (0.0004)
VOL (c_2)	-	-0.008 -3.659 (0.0002)	-0.008 -4.055 (0.0001)	-0.01 -4.658 (0.0001)	-0.008 -3.888 (0.0001)
STDRETN (c_3)	+	0.596 7.833 (0.0001)	0.613 8.574 (0.0001)	0.611 8.346 (0.0001)	0.593 7.912 (0.0001)
System R^2 No. of obs.		0.26 261	0.22 261	0.17 261	0.22 261

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. $FINANCE^1$ is given by (future period capital expenditures - current period working capital)/(current period assets). ROA^1 is the ratio of net income to total assets. $PROP^1 = 1$ if $ROA^1 \geq 0.13$, otherwise $PROP^1 = 0$. COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for intercept terms).

Table 6.11
Results of the 3SLS regressions (with $PROP^2$)*

Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP_t^2 + a_4OWN_t + a_5INST_t$

$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	66.861 77.622 (0.0001)	65.323 58.152 (0.0001)	66.25 57.234 (0.0001)	66.896 79.411 (0.0001)
MVALUE (a_1)	+	0.151 3.617 (0.0002)	0.175 3.161 (0.0008)	0.172 3.792 (0.0001)	0.137 3.447 (0.0003)
$FINANCE^1$ (a_2)	+	6.332 4.211 (0.0001)	7.006 3.668 (0.0002)	6.081 3.55 (0.0002)	6.15 4.214 (0.0001)
$PROP^2$ (a_3)	-	-0.251 -0.321 (0.38)	-0.710 -0.698 (0.25)	0.281 0.346 (0.37)	-0.462 -0.620 (0.27)
OWN (a_4)	-	-0.155 -3.524 (0.0003)	-0.224 -3.630 (0.0002)	-0.145 -3.137 (0.0009)	-0.158 -3.680 (0.0001)
INST (a_5)	+	0.079 5.513 (0.0001)	0.113 5.956 (0.0001)	0.088 4.308 (0.0001)	0.084 5.803 (0.0001)
INTERCEPT (b_0)	?	0.114 4.670 (0.0001)	0.044 1.888 (0.03)	0.088 2.614 (0.0046)	0.102 3.715 (0.0001)
DISC (b_1)	-	-0.002 -7.017 (0.0001)	-0.001 -4.25 (0.0001)	-0.002 -4.076 (0.0001)	-0.002 -5.727 (0.0001)
ROA^1 (b_2)	-	-0.034 -3.035 (0.0013)	-0.039 -3.532 (0.0002)	-0.031 -2.581 (0.005)	-0.038 -3.409 (0.0004)
LEVER (b_3)	+	0.052 12.233 (0.0001)	0.053 12.169 (0.0001)	0.053 10.115 (0.0001)	0.054 12.472 (0.0001)
LIQUID (b_4)	-	-0.021 -5.187 (0.0001)	-0.018 -4.296 (0.0001)	-0.019 -4.538 (0.0001)	-0.02 -4.913 (0.0001)

Table 6.11--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_s)	+	0.254 2.528 (0.006)	0.291 2.784 (0.0028)	0.275 2.331 (0.01)	0.251 2.361 (0.0093)
INTERCEPT (c_0)	?	0.065 7.361 (0.0001)	0.053 5.719 (0.0001)	0.073 6.901 (0.0001)	0.068 6.492 (0.0001)
DISC (c_1)	-	-0.0009 -7.251 (0.0001)	-0.0007 -5.622 (0.0001)	-0.001 -6.822 (0.0001)	-0.001 -6.434 (0.0001)
VOL (c_2)	-	-0.005 -4.347 (0.0001)	-0.005 -4.221 (0.0001)	-0.004 -3.98 (0.001)	-0.005 -4.314 (0.0001)
STDRETN (c_3)	+	0.356 9.325 (0.0001)	0.355 9.044 (0.0001)	0.332 8.366 (0.0001)	0.350 8.772 (0.0001)
System R^2 No. of obs.		0.22 743	0.18 743	0.14 743	0.2 743

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. FINANCE[1] is given by (future period capital expenditures - current period working capital)/(current period assets). ROA[1] is the ratio of net income to total assets. PROP[2] = 1 if ROA[2] $\geq$0.14, otherwise PROP[1] = 0. COD[1] is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for the intercept terms).

Table 6.12
Results of the 3SLS regressions (with $PROP^3$)*

Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^3_t + a_4OWN_t + a_5INST_t$

$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	67.327 88.053 (0.0001)	65.326 62.801 (0.0001)	64.036 53.512 (0.0001)	66.693 83.281 (0.0001)
MVALUE (a_1)	+	0.306 4.575 (0.0001)	0.463 5.012 (0.0001)	0.623 5.455 (0.0001)	0.374 5.309 (0.0001)
$FINANCE^1$ (a_2)	+	5.565 3.859 (0.0001)	6.314 3.456 (0.0003)	4.09 2.478 (0.007)	4.997 3.623 (0.0002)
$PROP^3$ (a_3)	-	-0.005 -3.021 (0.0013)	-0.009 -3.671 (0.0002)	-0.012 -3.862 (0.0001)	-0.007 -3.796 (0.0001)
OWN (a_4)	-	-0.114 -2.837 (0.0024)	-0.186 -3.177 (0.0008)	-0.157 -3.239 (0.0007)	-0.132 -3.357 (0.0004)
INST (a_5)	+	0.061 4.902 (0.0001)	0.098 5.588 (0.0001)	0.107 5.713 (0.0001)	0.074 5.588 (0.0001)
INTERCEPT (b_0)	?	0.167 5.091 (0.0001)	0.06 2.122 (0.0342)	0.022 1.114 (0.2658)	0.11 3.566 (0.0004)
DISC (b_1)	-	-0.003 -6.863 (0.0001)	-0.002 -4.077 (0.0001)	-0.001 -3.74 (0.0001)	-0.002 -5.383 (0.0001)
ROA^1 (b_2)	-	-0.028 -2.673 (0.0039)	-0.032 -2.947 (0.0017)	-0.033 -2.965 (0.0016)	-0.031 -2.902 (0.0019)
LEVER (b_3)	+	0.053 12.211 (0.0001)	0.053 12.195 (0.0001)	0.052 11.118 (0.0001)	0.053 12.453 (0.0001)
LIQUID (b_4)	-	-0.024 -5.502 (0.0001)	-0.018 -4.329 (0.0001)	-0.014 -3.709 (0.0001)	-0.019 -4.688 (0.0001)

Table 6.12--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_5)	+	0.210 2.062 (0.02)	0.264 2.466 (0.007)	0.303 2.834 (0.0024)	0.236 2.182 (0.015)
INTERCEPT (c_0)	?	0.077 6.858 (0.0001)	0.062 5.706 (0.0001)	0.072 8.642 (0.0001)	0.082 6.854 (0.0001)
DISC (c_1)	-	-0.001 -6.761 (0.0001)	-0.0008 -5.603 (0.0001)	-0.001 -8.846 (0.0001)	-0.001 -6.784 (0.0001)
VOL (c_2)	-	-0.004 -3.831 (0.0001)	-0.004 -3.277 (0.0006)	-0.003 -2.357 (0.0094)	-0.004 -3.134 (0.0009)
STDRETN (c_3)	+	0.341 8.858 (0.0001)	0.329 8.334 (0.0001)	0.295 7.766 (0.0001)	0.317 8.00 (0.0001)
System R^2 No. of obs.		0.2 743	0.17 743	0.19 743	0.2 743

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. FINANCE[1] is given by (future period capital expenditures - current period working capital)/(current period assets). ROA[1] is the ratio of net income to total assets. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). PROP[3] is the square of MVALUE. COD[1] is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for the intercept terms).

Table 6.13
Results of the 3SLS regressions (with $PROP^4$)*

Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^1_t + a_3PROP^4_t + a_4OWN_t + a_5INST_t$
$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$
$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	67.227 83.048 (0.0001)	65.630 61.140 (0.0001)	66.106 56.283 (0.0001)	67.138 81.549 (0.0001)
MVALUE (a_1)	+	0.141 3.803 (0.0001)	0.162 3.157 (0.0009)	0.178 3.823 (0.0001)	0.129 3.468 (0.0003)
$FINANCE^1$ (a_2)	+	5.939 4.08 (0.0001)	7.231 3.847 (0.0001)	5.956 3.478 (0.0003)	6.011 4.142 (0.0001)
$PROP^4$ (a_3)	-	0.079 0.03 (0.49)	1.001 0.296 (0.39)	-0.194 -0.063 (0.48)	0.521 0.205 (0.42)
OWN (a_4)	-	-0.133 -3.241 (0.0006)	-0.209 -3.491 (0.0003)	-0.149 -3.267 (0.0006)	-0.144 -3.505 (0.0003)
INST (a_5)	+	0.071 5.393 (0.0001)	0.106 5.855 (0.0001)	0.091 4.540 (0.0001)	0.078 5.580 (0.0001)
INTERCEPT (b_0)	?	0.142 4.916 (0.0001)	0.056 2.026 (0.0431)	0.082 2.502 (0.0063)	0.12 3.813 (0.0001)
DISC (b_1)	-	-0.003 -6.934 (0.0001)	-0.001 -4.014 (0.0001)	-0.002 -4.029 (0.0001)	-0.002 -5.595 (0.0001)
ROA^1 (b_2)	-	-0.032 -3.021 (0.0013)	-0.035 -3.258 (0.0006)	-0.032 -2.791 (0.0027)	-0.035 -3.251 (0.0006)
LEVER (b_3)	+	0.053 12.191 (0.0001)	0.053 12.193 (0.0001)	0.053 10.197 (0.0001)	0.054 12.543 (0.0001)
LIQUID (b_4)	-	-0.023 -5.331 (0.0001)	-0.019 -4.434 (0.0001)	-0.019 -4.452 (0.0001)	-0.021 -5.028 (0.0001)

Table 6.13--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_5)	+	0.242 2.386 (0.009)	0.289 2.700 (0.004)	0.279 2.367 (0.0092)	0.248 2.274 (0.012)
INTERCEPT (c_0)	?	0.073 7.104 (0.0001)	0.056 5.341 (0.0001)	0.072 7.119 (0.0001)	0.073 6.336 (0.0001)
DISC (c_1)	-	-0.001 -7.013 (0.0001)	-0.0007 -5.257 (0.0001)	-0.001 -7.037 (0.0001)	-0.001 -6.289 (0.0001)
VOL (c_2)	-	-0.005 -4.122 (0.0001)	-0.005 -3.951 (0.0001)	-0.004 -3.899 (0.0001)	-0.005 -4.122 (0.0001)
STDRETN (c_3)	+	0.352 9.184 (0.0001)	0.353 8.981 (0.0001)	0.332 8.454 (0.0001)	0.347 8.658 (0.0001)
System R^2 No. of obs.		0.2 743	0.17 743	0.14 743	0.19 743

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. FINANCE[1] is given by (future period capital expenditures - current period working capital)/(current period assets). ROA[1] is the ratio of net income to total assets. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). PROP[4] is the ratio of the sales of a firm to the total sales of top eight firms in the industry. COD[1] is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for the intercept terms).

Table 6.14

Results of the 3SLS regressions (with $FINANCE^2$)*

Model: $DISC_t = a_0 + a_1MVALUE_t + a_2FINANCE^2_t + a_3PROP^1_t + a_4OWN_t + a_5INST_t$

$COD_{t+1}{}^1 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

$SPREAD_{t+1} = c_0 + c_1DISC_t + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (a_0)	?	66.413 75.867 (0.0001)	65.570 55.830 (0.0001)	65.432 52.625 (0.0001)	66.709 76.683 (0.0001)
MVALUE (a_1)	+	0.178 3.882 (0.0001)	0.177 2.881 (0.0021)	0.206 3.726 (0.0001)	0.156 3.543 (0.0002)
$FINANCE^2$ (a_2)	+	0.362 0.19 (0.43)	1.036 0.402 (0.344)	2.116 0.866 (0.2)	1.06 0.571 (0.29)
$PROP^1$ (a_3)	-	-1.274 -1.538 (0.0623)	-1.891 -1.623 (0.053)	-0.883 -0.879 (0.19)	-1.391 -1.667 (0.048)
OWN (a_4)	-	-0.216 -4.534 (0.0001)	-0.284 -4.292 (0.0001)	-0.233 -4.356 (0.0001)	-0.213 -4.54 (0.0001)
INST (a_5)	+	0.08 5.628 (0.0001)	0.106 5.443 (0.0001)	0.101 4.771 (0.0001)	0.083 5.674 (0.0001)
INTERCEPT (b_0)	?	0.026 1.046 (0.296)	0.002 0.106 (0.916)	0.022 0.805 (0.22)	0.028 1.075 (0.283)
DISC (b_1)	-	-0.001 -3.37 (0.0004)	-0.001 -2.836 (0.0024)	-0.001 -2.73 (0.0033)	-0.001 -3.346 (0.0006)
ROA^1 (b_2)	-	-0.038 -3.541 (0.0002)	-0.039 -3.69 (0.0001)	-0.034 -3.041 (0.0012)	-0.039 -3.631 (0.0002)
LEVER (b_3)	+	0.051 11.856 (0.0001)	0.051 11.866 (0.0001)	0.049 10.026 (0.0001)	0.051 11.886 (0.0001)
LIQUID (b_4)	-	-0.012 -3.038 (0.0013)	-0.012 -3.062 (0.0012)	-0.011 -3.064 (0.0012)	-0.012 -3.021 (0.0013)

Table 6.14--continued

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
STDRETN (b_s)	+	0.358 3.451 (0.0003)	0.369 3.503 (0.0003)	0.366 3.216 (0.0007)	0.355 3.26 (0.0006)
INTERCEPT (c_0)	?	0.076 7.38 (0.0001)	0.058 6.511 (0.0001)	0.066 6.776 (0.0001)	0.077 6.871 (0.0001)
DISC (c_1)	-	-0.001 -7.288 (0.0001)	-0.0008 -6.400 (0.0001)	-0.001 -6.656 (0.0001)	-0.001 -6.815 (0.0001)
VOL (c_2)	-	-0.005 -4.427 (0.0001)	-0.006 -5.247 (0.0001)	-0.005 -4.744 (0.0001)	-0.005 -4.787 (0.0001)
STDRETN (c_3)	+	0.328 8.541 (0.0001)	0.342 8.871 (0.0001)	0.327 8.415 (0.0001)	0.318 8.176 (0.0001)
System R^2 No. of obs.		0.21 749	0.19 749	0.16 749	0.21 749

OWN represents the proportion of common stock held by the company CEO. INST is the proportion of common shares held by financial institutions. FINANCE[2] is given by the ratio of future period net cash inflow from financing activities to current period assets. ROA[1] is the ratio of net income to total assets. PROP[1] = 1 if ROA[1] $\geq$ 0.13, otherwise PROP[1] = 0. MVALUE is the market value of the firm's common shares at the end of the fiscal year (in billion $). PROP[1] is the ratio of the sales of a firm to the total sales of top eight firms in the industry. COD[1] is the ratio of interest expense to total liabilities net of the t-bill rate. SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, t-value, p-value for one-tailed test (two tailed test for the intercept terms).

Table 6.15
Results of cost of debt hypothesis (with COD^2)*
$COD_{t+1}{}^2 = b_0 + b_1DISC_t + b_2ROA_t{}^1 + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (b_1)	?	0.008 1.26 (0.207)	0.002 0.336 (0.737)	0.004 0.608 (0.543)	0.008 1.174 (0.241)
DISC (b_1)	-	-0.0001 -1.58 (0.0552)	-0.0001 -1.057 (0.15)	-0.0001 -1.386 (0.083)	-0.0001 -1.566 (0.0555)
$ROA^1(b_2)$	-	-0.035 -2.284 (0.0112)	-0.034 -2.26 (0.0121)	-0.035 -2.261 (0.012)	-0.035 -2.264 (0.012)
LEVERAGE (b_3)	-	0.025 3.608 (0.0002)	0.026 3.556 (0.0002)	0.027 3.574 (0.0002)	0.026 3.589 (0.0002)
LIQUID (b_4)	+	-0.0007 -0.174 (0.431)	-0.0007 -0.191 (0.43)	-0.0004 -0.116 (0.46)	-0.0008 -0.207 (0.42)
STDRETN (b_5)	+	0.74 6.693 (0.0001)	0.743 6.636 (0.0001)	0.729 6.636 (0.0001)	0.732 6.674 (0.0001)
Breusch Pagan χ^2 No. of obs. Adj. R^2		69.656 396 0.20	64.26 396 0.19	77.766 396 0.19	78.032 396 0.20

COD^2 is the average monthly yield on bonds over the firm's fiscal year net of the t-bill rate for the year. ROA^1 is the ratio of net income to total assets. LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed tests for the intercept terms).

Table 6.16

Comparison of the cost of debt results for ther high and low STDRETN groups*

$COD^1_{t+1} = b_0 + (b'_0 - b_0)A + b_1DISC_t + (b'_1 - b_1)D + b_2ROA^1_t + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (b_0)	?	-0.046 -5.545 (0.0001)	-0.039 -5.95 (0.0001)	-0.037 -5.565 (0.0001)	-0.388 -4.545 (0.0001)
A (b_0' - b_0)	?	0.0188 1.882 (0.03)	0.016 2.041 (0.041)	-0.0007 -0.095 (0.47)	0.016 1.546 (0.061)
DISC (b_1)	-	-0.00007 0.731 (0.233)	-0.00003 -0.473 (0.32)	-0.00007 -1.063 (0.144)	-0.00003 -0.321 (0.38)
D (b_1' - b_1)	-	-0.0003 -1.977 (0.025)	-0.0002 -2.227 (0.013)	-0.000007 -0.07 (0.48)	-0.0002 -1.629 (0.052)
ROA^1 (b_2)	-	-0.065 -5.511 (0.0001)	-0.066 -5.687 (0.0001)	-0.065 -5.498 (0.0001)	-0.066 -5.618 (0.0001)
LEVER (b_3)	+	0.04 8.664 (0.0001)	0.041 9.081 (0.0001)	0.041 8.834 (0.0001)	0.041 8.853 (0.0001)
LIQUID (b_4)	-	-0.012 -3.122 (0.0009)	-0.012 -3.079 (0.001)	-0.012 -3.059 (0.0012)	-0.012 -3.153 (0.0008)
STDRETN (b_5)	+	0.421 2.273 (0.012)	0.418 2.282 (0.0113)	0.441 2.397 (0.0083)	0.413 2.243 (0.0135)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		56.858 0.23 1133	52.753 0.23 1133	56.992 0.22 1133	53.619 0.23 1133

COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. ROA^1 is the ratio of net income to total assets. LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to

Table 6.16--continued

the disclosure scores. A = 1 for firms with above average STDRETN; 0 otherwise.
D = the disclosure scores, DISC, for firms with above average STDRETN; 0 otherwise.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed tests for the intercept terms).

Table 6.17
Comparison of the bid-ask spread results between high and low STDRETN groups*
$SPREAD_{t+1} = c_0 + c_1DISC_t + (c'_1 - c_1)D + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (c_0)	?	0.007 2.686 (0.007)	0.006 3.83 (0.0001)	0.003 1.534 (0.125)	0.007 3.149 (0.0008)
DISC (c_1)	-	-0.00008 -3.388 (0.0004)	-0.00008 -4.266 (0.0001)	-0.00003 -1.776 (0.038)	-0.0001 -3.652 (0.0002)
D ($c'_1 - c_1$)	-	-0.000005 -0.453 (0.33)	-0.000006 -0.539 (0.3)	-0.000003 -0.222 (0.413)	-0.000004 -0.349 (0.37)
VOL(c_2)	-	-0.007 -5.997 (0.0001)	-0.007 -6.301 (0.0001)	-0.007 -6.018 (0.0001)	-0.007 -6.059 (0.0001)
STDRETN (c_3)	+	0.503 5.669 (0.0001)	0.506 5.93 (0.0001)	0.497 5.662 (0.0001)	0.497 5.695 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		501.284 0.23 926	515.275 0.24 926	478.097 0.22 926	504.333 0.23 926

SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores. D = the disclosure scores, DISC, if STDRETN is above the mean; 0 otherwise.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two-tailed tests for the intercept terms).

Table 6.18

Comparison of the results of the debt hypothesis for high and low DISP groups*

$COD^{1}_{t+1} = b_0 + b_1 DISC_t + (b'_1 - b_1)D + b_2 ROA^{1}_t + b_3 LEVER_t + b_4 LIQUID_t + b_5 STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (b_0)	?	-0.042 -6.065 (0.0001)	-0.041 -7.166 (0.0001)	-0.051 -8.422 (0.0001)	-0.041 -5.777 (0.0001)
DISC (b_1)	-	-0.0001 -1.618 (0.053)	-0.0001 -2.784 (0.003)	-0.000006 -0.12 (0.46)	-0.0001 -1.85 (0.033)
D ($b_1' - b_1$)	-	-0.00003 -1.716 (0.044)	-0.00004 -1.803 (0.036)	0.00003 -1.669 (0.048)	-0.00004 -1.85 (0.033)
ROA^1 (b_2)	-	-0.063 -5.001 (0.0001)	-0.062 -4.917 (0.0001)	-0.063 -5.009 (0.0001)	-0.063 -4.984 (0.0001)
LEVER (b_3)	+	0.041 8.181 (0.0001)	0.042 8.481 (0.0001)	0.415 8.12 (0.0001)	0.042 8.366 (0.0001)
LIQUID (b_4)	-	-0.008 -1.853 (0.032)	-0.008 -1.92 (0.028)	-0.007 -1.724 (0.043)	-0.008 -1.88 (0.03)
STDRETN (b_5)	+	0.583 4.857 (0.0001)	0.586 4.919 (0.0001)	0.589 4.882 (0.0001)	0.724 4.018 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		26.73 0.22 724	26.624 0.22 724	28.932 0.21 724	27.587 0.22 724

COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. ROA^1 is the ratio of net income to total assets. LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores and DISP refers to the dispersion in financial analysts' earnings per share forecasts. D = the disclosure scores, DISC, if DISP is above the median value; 0 otherwise.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed tests for the intercept terms).

Table 6.19
Comparison of the bid-ask spread results between high and low DISP groups*
$SPREAD_{t+1} = c_0 + c_1DISC_t + (c'_1 - c_1)D + c_2VOL_t + c_3STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (c_0)	?	0.007 3.929 (0.0001)	0.006 4.101 (0.0001)	0.004 2.665 (0.0077)	0.007 3.469 (0.0005)
DISC (c_1)	-	-0.00007 -3.023 (0.0013)	-0.00006 -2.92 (0.0018)	-0.00002 -1.519 (0.0644)	-0.00007 -2.507 (0.0061)
D ($c_1' - c_1$)	-	0.00001 2.194 (0.0141)	0.00001 2.237 (0.013)	0.00001 2.357 (0.0093)	0.00001 2.258 (0.013)
VOL(c_2)	-	-0.009 -9.598 (0.0001)	-0.009 -9.883 (0.0001)	-0.009 -9.719 (0.0001)	-0.009 -9.723 (0.0001)
STDRETN (c_3)	+	0.382 6.626 (0.0001)	0.383 6.724 (0.0001)	0.385 6.712 (0.0001)	0.381 6.689 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		495.879 0.25 767	513.795 0.25 767	481.636 0.24 767	508.589 0.25 767

SPREAD represents the relative bid-ask spread of the firm: 2(ASK-BID)/(BID+ASK). STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores and DISP represents dispersion in financial analysts' earnings per share forecasts. D = the disclosure scores DISC, if DISP is above the median; 0 otherwise.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two-tailed tests for the intercept terms).

Table 6.20
Comparison of the cost of debt results between "good news" and "bad news" firms*
$COD^1_{t+1} = b_0 + b_1DISC_t + + (b'_1 - b_1)D + b_2ROA^1_t + b_3LEVER_t + b_4LIQUID_t + b_5STDRETN_t$

VARIABLE	Expected Sign	Annual report	Quarterly & other	Investor relations	Total scores
INTERCEPT (b_0)	?	-0.043 -5.868 (0.0001)	-0.043 -6.842 (0.0001)	-0.054 -8.432 (0.0001)	-0.043 -5.646 (0.0001)
DISC (b_1)	-	-0.0001 -1.554 (0.061)	-0.0001 -2.454 (0.0071)	0.00001 0.24 (0.41)	-0.0001 -1.692 (0.046)
D ($b'_1 - b_1$)	-	-0.00006 -3.101 (0.001)	-0.00006 -3.127 (0.0009)	-0.00006 -2.999 (0.0014)	-0.00006 -3.131 (0.0009)
ROA^1 (b_2)	-	-0.056 -3.838 (0.0001)	-0.058 -3.939 (0.0001)	-0.057 -3.888 (0.0001)	-0.056 -3.861 (0.0001)
LEVER (b_3)	+	0.044 8.631 (0.0001)	0.046 8.909 (0.0001)	0.045 8.551 (0.0001)	0.046 8.838 (0.0001)
LIQUID (b_4)	-	-0.006 -1.329 (0.092)	-0.006 -1.343 (0.09)	-0.005 -1.19 (0.12)	-0.006 -1.334 (0.092)
STDRETN (b_5)	+	0.534 4.106 (0.0001)	0.536 4.159 (0.0001)	0.552 4.204 (0.0001)	0.534 4.116 (0.0001)
Breusch-Pagan χ^2 Adj. R^2 No. of obs.		26.628 0.21 654	25.414 0.21 654	27.913 0.2 654	27.019 0.21 654

COD^1 is the ratio of interest expense to total liabilities net of the t-bill rate. ROA^1 is the ratio of net income to total assets. LEVER is the ratio of total liabilities to total assets while LIQUID is the ratio of current assets to total assets. STDRETN is the standard deviation of daily stock returns calculated over the firm's fiscal year. VOL is the average number of shares (in millions) traded per day over the firm's fiscal year. DISC refers to the disclosure scores and DISP refers to the dispersion in financial analysts' earnings per share forecasts. D = DISC for "good news" firms, 0 otherwise.

*The information is presented in the form: coefficient, White's (heteroscedasticity corrected) t-value, p-value for one-tailed test (two tailed tests for the intercept terms).

CHAPTER 7
SUMMARY AND CONCLUSIONS

This dissertation empirically examined a company's incentives and disincentives for voluntary disclosure of private information. The research yielded a number of interesting findings. First, consistent with the arguments of Hakansson (1981) and Kim (1993), the results revealed that disclosures are negatively associated with the proportion of company stock owned by the CEO. Thus larger management stock ownership may not align interests of managers and shareholders to the extent that shareholders prefer more disclosures. Second, a positive association between disclosures and institutional ownership of the firm was observed, suggesting that institutional investors with their superior monitoring and information processing skills are able to induce firms to make more timely disclosures. Third, the results provided some evidence of a link between disclosures and the disclosing firm's cost of capital. Thus, firms with higher disclosure scores were found to enjoy a lower cost of debt and a narrower bid-ask spread (or lower transactions cost). Moreover, firms with greater external financing requirements were found to have higher disclosure scores consistent with the argument that these firms try to achieve a lower cost of capital through such disclosures. The results, however, did not provide any evidence to support the hypothesized negative association between disclosures and a firm's cost of equity. The study also examined if a firm's disclosure decisions are affected by potential proprietary costs of such disclosures. The results provided weak evidence of a negative relationship between disclosures and proprietary costs as hypothesized by Verrecchia (1983), Darrough and Stoughton (1990) and others.

Finally, the study investigated if firms with lower disclosure scores had a larger incidence of insider trading. The results did not support this hypothesis.

A number of additional tests were performed to examine the robustness of the results. First, a number of different proxies for the disclosure scores were tried out to see if the results were driven by possible biases arising from analyst differences and sample selection. The results were found to be largely unaffected by such manipulations. Second, some tests were performed to see if the impact of disclosures depended on the overall level of uncertainty in the market. It is expected that disclosures would have a stronger effect on the bid-ask spread of the firm's stock and its cost of capital in an environment where there is already a lot of uncertainty in the market. Results, based on two proxies for market uncertainty - standard deviation of stock returns and dispersion of analysts' forecasts - were mixed. Third, some tests were performed to examine if the relationship between disclosures and cost of capital varied systematically according to whether the firm was releasing good news or bad news. A negative relationship between disclosures and the firm's cost of capital is expected for firms releasing good news. The same relationship may not hold for firms releasing bad news. The disclosure scores used in this study did not distinguish between good news and bad news so that mean analyst forecasts of earnings per share were compared to actual values to classify firms as good news and bad news types. The results suggested that the negative relationship between disclosures and cost of capital is much stronger for good news firms, as compared to the bad news firms.

All of the tests were carried out using four disclosure scores: an annual report score, a quarterly reports and other published information score, an investor relations score and a total score. The results of the tests using all four scores yielded very similar conclusions. In general, the investor relations score seemed to be the most noisy. There was no evidence to suggest that management incentives differed according to the type of disclosures.

The findings of this research could have important implications for investors, auditors and regulatory authorities. Investors could use the factors identified to estimate a firm's "willingness" to disclose information and make investment and information search decisions. Thus, investors who may not have easy access to timely stock quotes, analysts' updates etc., may choose to avoid investing in closely held firms, following the argument that these firms have incentives to withhold private information. The results of this study could also help auditors to estimate the inherent risk of an engagement more accurately and make proper audit effort decisions. For example, high management stock ownership and proprietary costs of a firm may suggest that these firms are likely to withhold private information so that more careful audits may be needed. A proper evaluation of a firm's stock ownership structure, external financing needs, and proprietary costs could thus be an important part of the evaluation of a firm's internal control structure. Regulatory authorities could also use the results of this research to reevaluate accounting and corporate regulatory policies. Thus, the SEC, for example, could reexamine management and institutional stock ownership restrictions in the light of the findings. Current laws allow firm managers to own significant proportion of a company's stock. If such ownership provides incentives for nondisclosure, restrictions could be imposed on it.[1] Similarly, the SEC could encourage more institutional ownership by relaxing the existing stock ownership restrictions to promote more timely disclosures. Accounting regulation could also be selectively applied to companies with critical levels of proprietary costs or management stock ownership to ensure that firms with high proprietary costs or managerial ownership release value relevant information that investors can use in a timely manner.

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[1]Of course the negative effects of nondisclosure of information have to be weighed against potential benefits of large managerial ownership such as improvements in productive efficiency of the firm.

While this study shed light on some of management's incentives for disclosing or withholding private information, it has some potential limitations. First, the measure of disclosure used in the study is based on perceptions of financial analysts about firms' disclosure strategies. Although these analysts are experts at evaluating firms' disclosure practices, it is unlikely that their scores are perfect measures of a firm's overall disclosure efforts. Biases and errors could thus be present in the scores used. While the results of this study did not suggest the existence of any serious biases, the possibility cannot be ruled out without further analysis. A second potential limitation of this study is its generalizability of the results to the population of all publicly traded firms. The firms selected to be evaluated by the Association for Investment Management and Research are those that are followed by a number of financial analysts. Thus, these firms tend to be larger and more frequently traded. Moreover, firms are drawn from a limited number of industries. Whether the results generalize to all firms is an issue that needs to be explored further.

The study points to a number of areas for further research. One possibility is to investigate financial analysts' motives for preparing the disclosure scores. The stated objective of the financial analysts is to promote clearer and more timely disclosures by corporations. It would be interesting to see if the analysts actually have any incentives to systematically differ from this policy. A careful examination of these incentives can improve our understanding of the disclosure scores. A second area of research could be to explore the link between management's compensation and their disclosure practices in more details. The nature of management's compensation schemes could provide them with specific incentives. Depending on the their compensation agreement, managers' planning horizon could be short or long, their incentives could be stock based or earnings based and these factors could have important implications on their disclosure strategy. The presence or absence of long term performance plans, the presence of stock options, the existence of deferred compensation, etc., could be important determinants of

discretionary disclosures. A third area of research could be to test some of management's incentives hypothesized here in the context of other types of discretionary disclosures like management forecasts, early adoptions of disclosure rules, etc.. This could improve the generalizability and robustness of the results of this research. Fourthly, it might be interesting to see if the disclosure scores used in this study are related to other management incentive variables. For example, it may be interesting to see if firms with low disclosure scores are more likely to manipulate earnings through discretionary accruals; if firms with low disclosure scores are also more likely to make frequent accounting method changes; etc.. Lastly, it might be interesting to examine if firms consistently follow certain disclosure strategies over a number of years. The results of this study indicate that disclosure scores of firms tend to be quite highly correlated across years. There is no clear explanation on how firms can benefit from maintaining a consistent disclosure strategy in a changing environment. Future research trying to explore why firms have such stable disclosure strategies could improve our understanding of management's disclosure incentives.

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BIOGRAPHICAL SKETCH

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Professor of Accounting

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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